

KAIZEN HANDBOOK

JUNE 2018



Japan International Cooperation Agency (JICA)

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List of Abbreviation

AFD	Agence Française de Développement/ French Development Agency
APME (Cameroon)	Agence de Promotion des Petites et Moyennes Entreprises/ Agency for Small and Medium-sized Enterprises Promotion
BDS	Business Development Service
C/P	Counterpart
CETIME (Tunisia)	Centre Technique des Industries Mécaniques et Électriques / Technical Center for Mechanical and Electrical Industries
CRT	Class Room Training
EKI (Ethiopia)	Ethiopia KAIZEN Institute
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit / German Corporation for International Cooperation
GTP2 (Ethiopia)	Growth and Transformation Plan II
HRD	Human Resource Development
ICT	In Company Training
IE	Industrial Engineering
INTI (Argentina)	Instituto Nacional de Tecnologia Industrial / National Institute of Industrial Technology
JIS	Japanese Industrial Standards
JIT	Just In Time
JPC	Japan Productivity Center
JUSE	Union of Japanese Scientists and Engineers
KIBT (Kenya)	Kenya Institute of Business Training
KIZ (Zambia)	KAIZEN Institute of Zambia Limited
MPC (Malaysia)	Malaysian Productivity Corporation
MPSHRD (Ethiopia)	Ministry of Public Service and Human Resource Development
NBSSI (Ghana)	National Board for Small Scale Industries
NPB (Singapore)	National Productivity Board
NEPAD	New Partnership for Africa's Development
OJT	On the Job Training
QC	Quality Control
QCC	Quality Control Circle
QCD	Quality/Cost/Delivery
SMED	Single Minute Exchange of Die
SQC	Statistical Quality Control
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TICAD	Tokyo International Conference on African Development
ToT	Training of Trainers
TPM	Total Productive Maintenance
TPS	Toyota Production System
TQC	Total Quality Control
TQM	Total Quality Management
TVET	Technical and Vocational Education and Training
UGPQ(Tunisia)	Unité de Gestion du Programme National de Promotion de la Qualité en Tunisie/ Management Unit for the National Quality Promotion Program in Tunisia

Definition of *Kaizen*-related Terms

Various *Kaizen* terms that have been used under different names in previous JICA projects, including personnel relating to *Kaizen* dissemination, names of training programs relating to human resource development, and personnel who has completed various training programs, are defined in this handbook as follows.

Kaizen

The core value of *Kaizen* is placed in creating the attitude shared among all members of an organization who consistently pursue advanced levels of quality and productivity, and not just applying its management method. *Kaizen* is a comprehensive knowledge that consists of broad technologies such as 5S, 7 QC tools, TQM, TPS, Lean Production System, etc. to pursue activities under this core value.

Note: Japan Industrial Standard (JIS) defines “KAIZEN (JIS8141, No.1110) as a production management term as follows:

“An activity conducted by a small group or a small number of persons to review an overall management system or its part and to improve capacity and other capabilities”

The English name is KAIZEN or continuous improvement.

Kaizen Activity

An activity using *Kaizen* techniques and systems to improve the present work styles, methods or conditions and to upgrade quality levels of products, service or operations to a desirable condition.

Kaizen Consultant

A person who has been accepted by a *Kaizen*-related licensing or certification system as a *Kaizen* Consultant. *Kaizen* Consultants are divided into three categories, namely *Kaizen* Consultants, Senior *Kaizen* Consultants, and Principal *Kaizen* Consultants.

Kaizen Trainer

A person who gives guidance on *Kaizen* activities to companies and other organizations. They are classified into Basic *Kaizen* Trainers and Advanced *Kaizen* Trainers. To become a *Kaizen* Consultant, it is necessary to have capacity and skills required of Advanced *Kaizen* Trainers.

Advanced Kaizen Trainer

A person who has obtained skills on both Basic *Kaizen* and Advanced *Kaizen* by receiving training specifically designed to train *Kaizen* Trainers, which is conducted under the guidance of experts or senior Advanced *Kaizen* Trainers, or by receiving other training equivalent to it.

Advanced *Kaizen* Trainers are responsible for provision of *Kaizen* guidance and service (training and consulting) for private companies and other organizations and training of junior *Kaizen* Trainers (both Basic *Kaizen* Trainers and Advanced *Kaizen* Trainers).

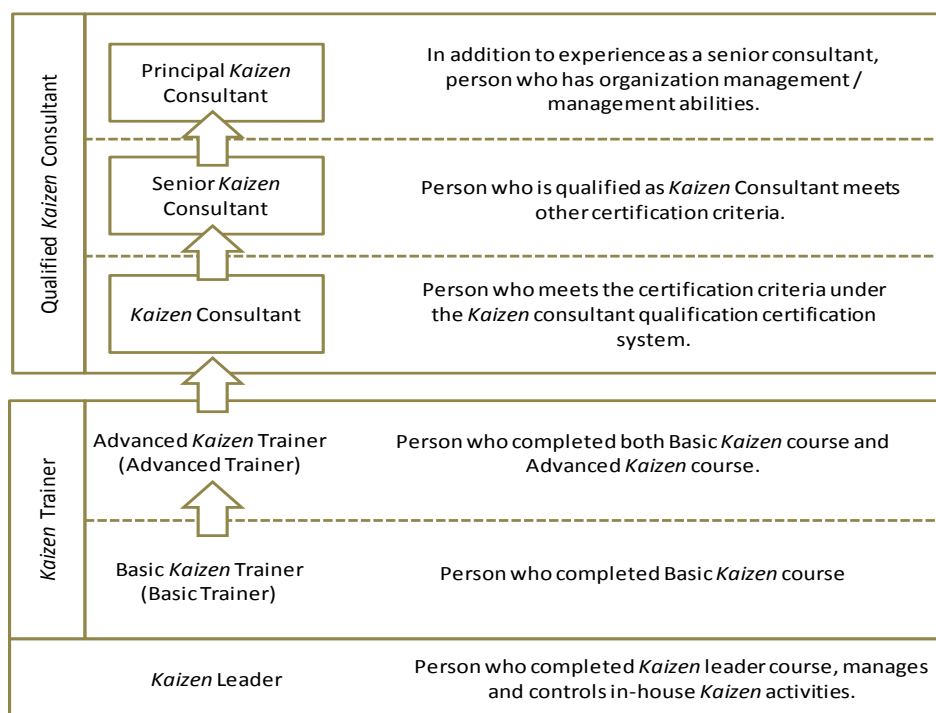
Basic *Kaizen* Trainer

A person who has obtained skills on Basic *Kaizen* by receiving training specifically designed to train Basic *Kaizen* Trainers, which is conducted under the guidance of experts or Advanced *Kaizen* Trainers. He/she provides companies and other organizations with training and consulting service on Basic *Kaizen*.

Kaizen Leader

A person who has received *Kaizen* Leader training from experts, Advanced *Kaizen* Trainers or Basic *Kaizen* Trainers prior to the start of *Kaizen* activities within the organization he/she belongs to. He/she is responsible for administration and promotion of *Kaizen* activities in it. He/she has skills and experience on *Kaizen*, which are equivalent to those of Basic *Kaizen* Trainers.

Career Path for *Kaizen*-related Human Resource



Source: JICA Study Team

Structure of *Kaizen* Trainers and *Kaizen* Consultants

Class Room Training (CRT)

A general term for training programs, centered on lecture, designed for candidate *Kaizen* Trainers.

In Company Training (ICT)

A general term for training programs for candidate *Kaizen* Trainers in which they actually provide *Kaizen* guidance with companies and/or other organizations and thereby learn practical *Kaizen* skills.

Basic *Kaizen*

Kaizen activities which are basic and need to be implemented regardless of business types or capacity levels, such as 5S, Visual Control, and *Muda-dori*. It is *Kaizen* at the elementary level, which is implemented regardless of company sizes and also easy to take effect in a short period. CRT and ICT for Basic *Kaizen* Trainers cover a range of subjects required for these activities (both knowledge and skills).

Advanced *Kaizen*

Kaizen activities which apply engineering techniques to deal with specific problems such as productivity improvement, reduction of a defect rate, and cost reduction. It applies statistical management and counting management methods. CRT and ICT for Advanced *Kaizen* Trainers cover a range of subjects required for these activities (both knowledge and skills).

Base Line

Quantitative values representing conditions prior to the start of *Kaizen* activities (e.g. 10% defect ratio). *Kaizen* result is measured by comparison with the baseline. It has the same meaning as conditions before *Kaizen* of the before-after analysis.

Lean Production System

Production management techniques restructured and generalized based on the Toyota Production System, with an aim to reduce the total cost of the whole production system by eliminating waste in the production process.

Six Sigma

Quality management techniques to identify a cause for a problem relating to a product or a production process and thereby to implement corrective measures by analyzing a production and other process using statistical analysis and quality management techniques in a systematic manner to reduce defect rates, improve customer satisfaction, etc. As the action process for Six Sigma, the MAIC (measurement, analysis, improvement, and control) cycle, as evolved from the PDCA cycle used in QC activity, is repeated continuously.

ISO18404

An international standard on management improvement techniques as established and announced by ISO in 2011. It sets certification requirements for “Six Sigma” and related “Green Belt (GB)/Black Belt (BB)/Master Black Belt (MBB) as ISO 18404 (Quantitative Techniques for

Process Improvement – Six Sigma – Capacity of Key Personnel and Organization’s Suitability for Implementation of Six Sigma and Lean Production).

Business Development Service: BDS

A general term for various services, except for financial support, to encourage and promote entry, growth and survival in a market by microenterprises and SMEs, and improvement of their productivity and competitiveness.

Introduction

Japan International Cooperation Agency (JICA) has been providing support for *Kaizen* projects in industrial sectors in around 30 countries so far. As for African countries, *Kaizen*-related technical cooperation projects have been carried out in 8 countries since the first project in Tunisia was implemented in 2006. Naturally, these projects have been generating different results and impacts among the countries. Various lessons were learned: such as the need to ensure commitment of high level government officials, the need to establish and maintain a strong *Kaizen* promotion organization and system, and standardization of an approach to secure quality of *Kaizen* promotion personnel. To further accelerate industrial development through dissemination of *Kaizen* in the African continent, JICA in collaboration with NEPAD (New Partnership for African Development) Agency launched “Africa KAIZEN Initiative”.

As part of these efforts, a JICA research project, “Standardizing KAIZEN Approaches in Africa”, is conducted from April 2017 to June 2018. The research project is designed to ensure a more effective dissemination of *Kaizen* in Africa, by synthesizing and analyzing experiences accumulated in various countries where *Kaizen* projects were conducted, particularly in an attempt to establish specific processes and procedures for the implementation of the initiative and to standardize *Kaizen* approaches and curriculums for the development of human resources responsible for *Kaizen* dissemination. This handbook is intended to be used by policymakers of countries that are disseminating or have an intention to disseminate *Kaizen*. Practitioners actually engaged in *Kaizen* promotion are also one of the targets. It principally covers industrial sectors and presents curriculums, syllabus, and textbook lists for developing *Kaizen*-related human resources, and actual dissemination approaches and methods. The handbook also contains summaries of key success factors and lessons learned from different case studies.

Various *Kaizen* techniques introduced in this handbook are based on those created and modified through efforts and ingenuity of forerunners who have persistently been working in the area. Also, a variety of approaches to *Kaizen* dissemination proposed in the handbook are on the basis of activities of JICA projects conducted with a process of trial and error and with due considerations to social and cultural differences in each country as well as differences in industrial structure. Naturally, it must be admitted that there might be some lack of understanding on the knowledge and experiences within the Study Team, i.e., the handbook may not fully explain a true intent on and meaning of *Kaizen* dissemination, which is to be corrected or improved upon the reader’s feedback.

We hope that this handbook will be widely used and thus contribute to *Kaizen* dissemination in many countries, and then further contribute to the economic development agenda of the continent.

Finally, we would like to express our gratitude to all institutions and persons who have cooperated in the preparation of this handbook.

JICA Study Team (UNICO/JPC) for Research Study
on Standardizing KAIZEN Approaches in Africa

1. Overview of *Kaizen*

1. Overview of *Kaizen*

1.1 What is *Kaizen*?

1.1.1 Essence of *Kaizen*

The word “*Kaizen*” as a general term for “techniques and tools for improvement of quality and productivity” was first used in the Japanese manufacturing industry, but is now recognized worldwide. However, people have different views and perspectives on the understanding and the scope. In this handbook, the core value of “*Kaizen*” is placed in creating the attitude shared among all members of an organization who consistently pursue advanced levels of quality and productivity, and not just applying its management method. Hence, *Kaizen* is a comprehensive knowledge that consists of broad technologies such as 5S, 7 QC tools, TQM, TPS, Lean Production System, etc. to pursue activities under this core value.



Source: Adapted by the JICA Study Team from a JICA’s brochure “KAIZEN Management approach for enhancing quality and productivity: the driving force for economic development”

Figure 1.1-1 Characteristics and Effects of *Kaizen*

A question then arises as to what could be the benefits of implementing *Kaizen*? Fig. 1.1-1 summarizes major characteristics and effects of *Kaizen*. Among the five characteristics listed, the first one “participatory” indicates promotion and encouragement of participation by every member of an organization. The second one “continuous” emphasis on accumulation of daily activities, which leads to big results. The third one is “scientific approach” based on statistical data. The fourth one “economical” indicates placement of value on using brain to create much more ideas rather than spending money (making an investment), and the fifth one “universal” indicates its broad applicability: it uses easy-to-use tools and thus allows anyone to implement it, without special technology or equipment, in any field, organization or size.

The fundamental of *Kaizen* is to repeat Plan-Do-Check-Act (PDCA) cycles (see Fig. 1.1-2). Along with repeating of the PDCA cycle, everyone in the organization acquires mind and attitude to pursue a high level of quality and productivity constantly, which leads to improvement of own work quality and improvement of QCD (Quality/Cost/Delivery).



Source: JICA Study Team

Figure 1.1-2 *Kaizen* Implementation Process and the PDCA Cycle

Continuing *Kaizen* activities with these characteristics brings about the effects presented in Fig. 1.1-1. With a strong inclination toward human resource development, *Kaizen* enables implementing organizations to develop discipline, engagement, and teamwork of individuals and ultimately strengthen “firm capabilities”¹ as well as to improve quality and productivity of goods and service.

For instance, Ethiopia KAIZEN Institute (EKI), which has been conducting training of *Kaizen* practitioners and institutional development for *Kaizen* dissemination under JICA’s support, estimates the cumulative economic effect produced at companies, mainly manufacturers, during the five-year period since 2011 at more than \$100 million. In the same period, the government’s

¹ Firm capabilities are a source of company growth, referring to overall capacity and skills an individual company possesses.

EKI-related budget was as little as \$4.13 million, and the total expenses including JICA's support around \$10 million². This indicates that *Kaizen* promotion is a cost-effective policy measure.

At the same time, as already explained, *Kaizen* drives change in people's mindset and thus functions as a means to develop core capacity of the people as well as functions as an instrument of industrial policy. Although it is difficult to show benefits of such change in the short term, it is actually important for country's growth in the long term.

This approach of *Kaizen* was transferred from Japan to Asian countries, such as Singapore and Malaysia, in the 1980s, and also to Western countries. And now each country has developed it in their own way.

1.1.2 Need for Application of *Kaizen* in Africa

Key issues of the manufacturing industry commonly seen in Africa, especially in the Sub-Saharan region, are summarized as follows.

- The manufacturing industry's GDP share is fairly small, with low productivity.
- The manufacturing industry has a low job creation rate while high unemployment is prevalent, especially in young generations.
- The manufacturing industry consists of a small number of mid-sized and large enterprises and a large number of micro enterprises and small enterprises.
- Educational background of most of company employees is limited to primary education or less, barely qualified for working at modern industrial facilities.
- Traditional and non-modern business/labor management system and practice still remains.

These are common problems in Africa, but some companies have already overcome these problems and adopted a modernized business/labor management system and practice. However, issues listed above are true at the national level for almost all African countries, if not all³. Developing medium- and high-tech sub-sectors and increasing value added of the industry as a whole are also challenges for African countries, although the manufacturing industry in Africa records steady growth in recent years: more than half of the value added in the industry is generated by the low-tech sub-sectors, and around 20% by the medium-low-tech sub-sectors⁴; the value added created by African manufacturers accounts for as low as 2% of the world total value added in manufacturing; and furthermore, the value added per capita by the manufacturing

² As EKI's and JICA's budgets contain labor costs that account for large portions, the amount used for program implementation is much smaller.

³ The ratio of manufacturing industry in the Sub-Sahara region's GDP is less than half of the world average (7.6%) according to World Development Indicators 2016 of the World Bank. The unemployment rate is close to the world average at 8.01% in adult people, but among those under 24years old or younger, the ratio is high at 14.1%.

⁴ The composition by technology levels in 2015 is as follows: the low-tech sub-sectors account for 58.2%, the medium-low-tech sub-sectors 22.6%, and the medium-high-tech and high-tech sub-sectors 19.2%. The share of the medium-high-tech and high-tech sub-sectors gets higher, as the industrial structure becomes more technically advanced and the manufacturing sector becomes more competitive. Source: UNIDO, Industrial Development Report 2018.

industry, which is a good indicator of the level of industrialization, remains below \$100 in 13 African countries, while the highest country manages to exceed \$1,000⁵.

African countries do not necessarily need to copy the same patterns of industrial development in Asian countries, but they can learn experiences and lessons of Asia and other countries on the basis of accurate recognition of issues and challenges facing them, so as to conceive new models for development that meet their own needs. Whatever models they develop, promoting industrialization and increasing competitiveness remain common challenges at the national level. At the company level, it is critical to improve firm capabilities required to meet QCD requirements demanded in the marketplace. Firm capabilities are composed of various elements, but they roughly fall into management capability and adaptability of workforce, which can be effectively strengthened by *Kaizen*.

Recently, African countries are also moving toward introduction of *Kaizen* in the education sector, which reflects better understanding of the intrinsic value of *Kaizen*. This represents an effort to learn soft skills required at workplaces through *Kaizen* practice, such as compliance with work rules, positive attitude, commitment, and good communication with coworkers, other than traditional technical skills.

1.2 Differences in Quality/Productivity Management in Japan and in Europe and the U.S.A.

1.2.1 Development history of quality/productivity improvement in Japan until 1980

Kaizen has developed and evolved spontaneously in individual Japanese companies that had learned management techniques from the U.S./Europe under the guidance of organizations in charge of promotion of quality/productivity improvement.

During the economic reconstruction period after the Second World War, Japanese products were viewed as “cheap but of poor quality (what you get is what you pay for). To overturn such reputation, an industry-wide move for quality/productivity improvement emerged, and the Union of Japanese Scientists and Engineers (JUSE) was one of the organizations that played a central role in the move. The JUSE frequently conducted educational programs on quality control for corporate owners and managers as well as training programs on statistical management techniques including a seminar inviting Dr. Edwards Deming – a renowned statistician in the U.S. – in 1950. Companies increasingly learned the importance of quality control and began to make committed efforts at their production facilities: in many factories, voluntary groups (QC circles: QCCs) were formed in every production step to conduct a variety of workplace improvement activities, such as

⁵ In Africa, Swaziland has the highest value added per capita, amounting to \$1,045 in 2014. Among the high-income countries in the world, Switzerland is the highest (\$14,392) and Portugal the lowest (\$2,645) in the same year. Source: UNIDO, Industrial Development Report 2018.

5S (Sort, Set-in-order, Shine, Standardization, and Sustain), *Muda-dori* (waste elimination), reduction of defects, cost reduction, improvement of production facilities and equipment, and work safety management.

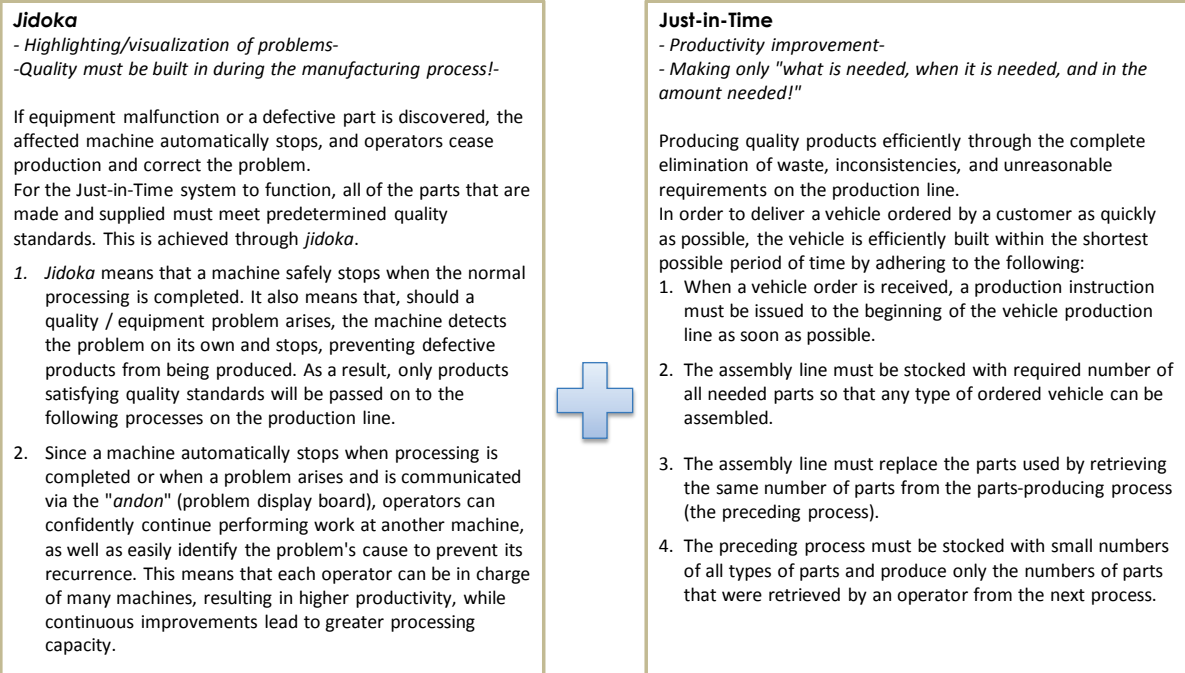
In parallel, the Japan Productivity Center (JPC), which was established in 1955 by three parties representing companies, labor unions and academia, acted as a promoter of the productivity movement, succeeding in making it nationwide movement. Since its establishment, the JPC has sent many missions for industrial tours to modern production facilities in the U.S. and other advanced countries to learn quality/productivity improvement techniques and know-how⁶. The results were shared at debrief sessions held throughout the country and were also compiled in reports for distribution, which also helped promotion of quality/productivity improvement in Japan⁷.

Quality/productivity improvement techniques originally introduced from the U.S.A. to Japan have been modified and improved spontaneously by many Japanese manufacturers according to their industry sectors, sizes, production environments and other factors. The Toyota Production System (TPS) is one of the well-known management systems developed in the process⁸. The TPS is based on two key concepts: the first one is *jidoka*, stopping a machine that malfunctions immediately so as to prevent defective products from being produced; and the second Just-In-Time (JIT), producing as many items as needed by the next process so as to avoid producing and storing too many items while ensuring smooth production as well (see Fig. 1.2-1). The Japanese manufacturing industry usually uses both a scientific approach based on data management and a bottom-up approach led by small group activities like QCCs in combination. As a result of broad-based quality/productivity improvement initiatives undertaken by numerous companies, quality of Japanese products have dramatically changed from poor to excellent, making Japan as a nation of world quality. In 1979, Dr. Ezra Vogel, a U.S. sociologist, analyzed key factors for rapid economic growth in Japan in his book, “Japan as Number One: Lessons for America,” and highly valued Japanese management, including the *Kaizen* initiative.

⁶ During the ten-year period between 1955 and 1964, JPC sent a total of 527 missions, consisting of 5,611 persons (of which 101 visited Europe and the remaining the U.S.A.): source – Japan Productivity Center for Socio-Economic Development, “50-year History of Productivity Movement” (2005), p.51.

⁷ JPC received financial support from the International Cooperation Agency (ICA) of the United States for the establishment and initial activities.

⁸ Source: Toyota Motor’s Web page, “Toyota Production System” (September 20, 2017)



http://www.toyota-global.com/company/vision_philosophy/toyota_production_system/
 Source: Toyota Motor Corporation Web Site "Toyota Production System"

Figure 1.2-1 Two Pillar Concepts of the Toyota Production System (TPS)

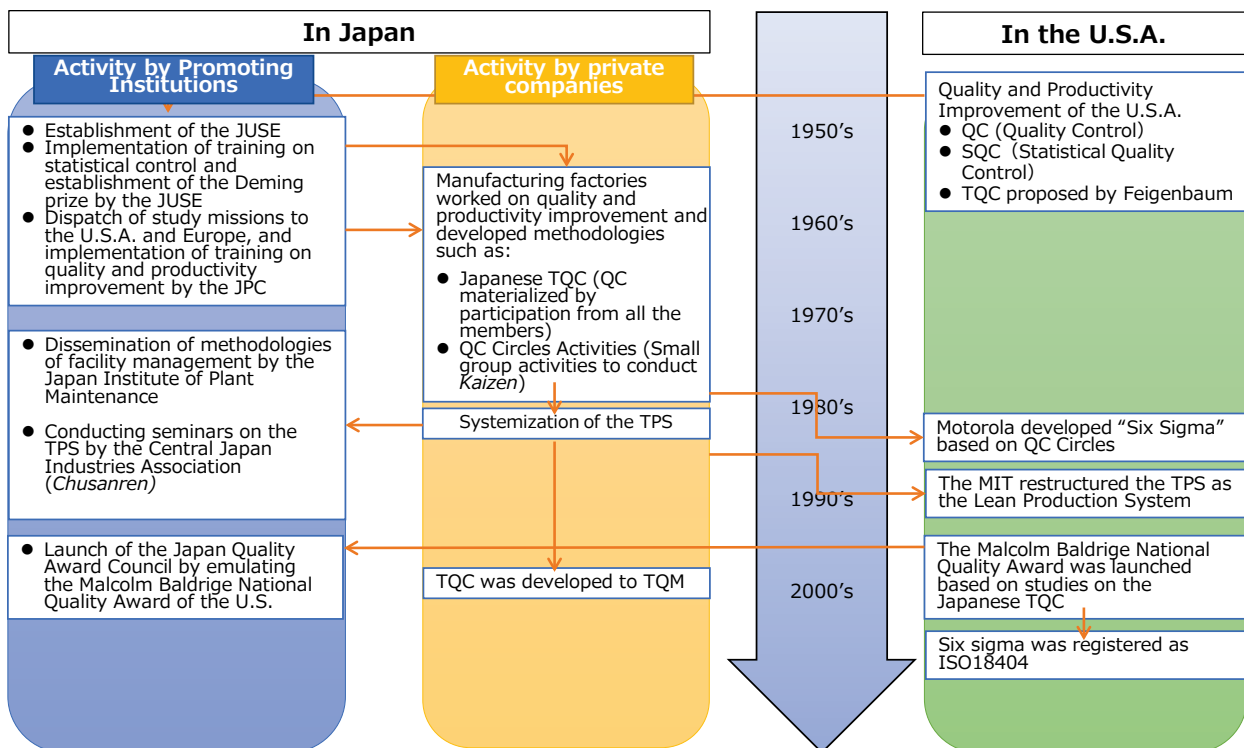
1.2.2 Evolution and modification of *Kaizen* in Europe and the U.S. since 1980

In the 1980s, many Japanese companies launched initiatives to improve quality as organizational effort by working on quality from the total viewpoint of developing and maintaining good products and services. This marks the birth of Total Quality Control (TQC)⁹. Most of Japanese top-ranking companies such as Toyota, Honda, Nissan, Yamaha, Suzuki, Panasonic, Sony, and Canon made committed efforts at TQC, thus helping their quality and productivity to be positioned in the world class. Such efforts to improve quality are not limited to production sector and have been actively undertaken by the service and public sectors for the interest of improving customer satisfaction. This attracted attention of corporate managers, engineers and scholars in Europe and the U.S.A., who came to Japan for factory tours to study key factors of the strength of Japanese companies. Then, many companies imported Japan's quality and productivity management techniques (reverse import for American and European companies), and restructured them to meet the European/American business environments.

A primary example is a research team of the Massachusetts Institute of Technology (MIT) that studied the TPS to search for sources of the Japanese auto industry's competitiveness and published a report entitled "The Machine that Changed the World" in 1990, in which the TPS is generalized, reorganized and named the "lean production system." "Six sigma," which was

⁹ Source: JUSE's Web site "History of Statistical Quality Control" (September 20, 2017)

developed by Motorola in the 1980s, is also a derivative of Japan's QCCs, which are characterized by the bottom-up structure and reliance on tacit knowledge, although it was modified to take a top-down approach and center on quantitative evaluation incorporating statistical techniques. Later, it was further developed by General Electric Company (GE) who applied it for process innovation of the overall management system. Today, the "lean production system" and "Six Sigma" as well as "Lean/Six Sigma" that combines the two approaches is increasingly applied as representative western quality/productivity improvement techniques. Fig. 1.2-2 presents the progress described thus far.



Source: JICA Study Team

Figure 1.2-2 Transition of Quality and Productivity Improvement in Japan and the U.S.A.

1.2.3 Comparison of quality/productivity improvement among Japan, Europe and the U.S.A.

As discussed earlier, the Japanese and European/American approaches and techniques for quality/productivity improvement have evolved through mutual learning and competition. As a result, there is no significant difference in terms of methodologies, while their basic approaches are different in the following aspects to reflect differences in the social background¹⁰.

¹⁰ While this characterization is not necessarily applicable to all the Japanese or European/American companies, it is said to be a general tendency on the both sides. There are many Japanese companies that adopt the European/American approach, and there are a number of European/American counterparts that accept the Japanese approach. Note that the above comparison is designed to describe the differences in a clear form, so that in the reality the two approaches are not clearly distinguished but rather are combined into a mixed form.

Table 1.2-1 Comparison of Approaches between Japan and Europe/the U.S.A.

Japanese Approach	Europe/the U.S. Approach
Human oriented: Put priority on utilization of human wisdom and experience rather than innovative techniques and resources/ investment.	Systems oriented: Upgrade systems, methodologies and facilities first, and then allocate necessary human and other resources.
Participatory approach (Combined application of the bottom-up and top-down approaches): Involve all the members from top executives to factory workers; everyone is expected to contribute ideas for improvement.	Top down approach: Some management people establish systems and the rest follow instructions.
Gemba (Site) oriented: Value observation, ideas and trials at <i>gemba</i> (site); suggestions from workers are most welcome.	Management oriented: Professional managers establish systems and the rest follow instructions.
Business growth through development of human resources: Optimize existing human (and other) resources first.	Business growth through system reforms: Innovate/reform systems first, then allocate necessary human and other resources to operate them.
Process oriented: Not only results but also processes are important. If a result is not good, try to identify causes in the process that have led to the result, and then modify the process.	Result oriented: Results are the most important. A process that brings about a good result is a good process.
Gradual advance: Make small and step-by step improvements, accumulation of which leads to a big difference in the end.	Quick and big change at once: Getting results promptly matters, so adopt a drastic method that can bring a big change quickly.
Utilization of the basic tools: Can start with simple actions based on basic methods and tools; apply advanced tools and techniques later if necessary.	Utilization of sophisticated techniques: Use systematic and sophisticated techniques including statistical tools from the beginning.

Source: JICA Study Team based on Masaaki Imai, “KAIZEN Reprinted edition,” 2010, McGraw-Hill Education

1.3 *Kaizen* and Innovation

1.3.1 Defining Innovation

All firms face the challenge of competing effectively with more advanced economies in a globalized market place. Successful firms seek ways to enhance their quality and productivity so that they can satisfy the customer’s needs and add greater value to the market. In this sense, innovation is a key element for the firm’s growth. And the question here is what is the relation of *Kaizen* and innovation.

When we discuss about the relationship between *Kaizen* and innovation, we need to define both concepts. In this handbook, the definition of *Kaizen* is introduced in 1.1.1.

Just like *Kaizen*, the definition of innovation seems to vary among each authors. A 2014 survey of literature on innovation found over 40 definitions.

In 2015, OECD¹¹ defined four types of innovation: product innovation, process innovation, marketing innovation and organizational innovation.

Product innovation: A good or service that is new or significantly improved. This includes significant improvement in technical specifications, components and materials, software in the product, user friendliness or other functional characteristics.

Process innovation: A new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.

Marketing innovation: A new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

Organizational innovation: A new organizational method in business practices, workplace organization or external relations.

Here, innovation can be summed up as new or significantly improved product (good or service) or process, a new marketing method or a new organizational method in business practices.

Another side of innovation is captured by time of innovation taking place. Here innovation is categorized in two types; radical innovation and incremental innovation. In Schumpeter's¹² view, radical innovations create major disruptive changes, whereas incremental innovations continuously advance the process of change

A radical or disruptive innovation is one that has a significant impact on a market and on the economic activity of firms in that market, while incremental innovation concerns an existing product, service, process, organization or method whose performance has been significantly enhanced or upgraded. Incremental innovation is the dominant form of innovation. In some cases, radical innovation may have started from incremental innovation since innovation process often includes small incremental steps that are not in themselves innovative.

1.3.2 Relation between *Kaizen* and Innovation

Masaki Imai may be the one of the first person who discussed the relationship between *Kaizen* and innovation. In his book “*Gemba Kaizen, -A commonsense approach to a continuous improvement strategy*”¹³, he describes innovation as an opposing concept from *Kaizen*.

¹¹ OECD/Eurostat (2005), *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition*, The Measurement of Scientific and Technological Activities, OECD Publishing, Paris, <https://doi.org/10.1787/9789264013100-en>.

¹² Joseph A. Schumpeter (1942) *Capitalism Socialism and Democracy*

¹³ Masaaki Imai (2012) *Gemba Kaizen, A commonsense approach to a continuous improvement strategy*, second edition

Innovation is dramatic, a real attention-getter. *Kaizen*, on the other hand, is often undramatic and subtle.

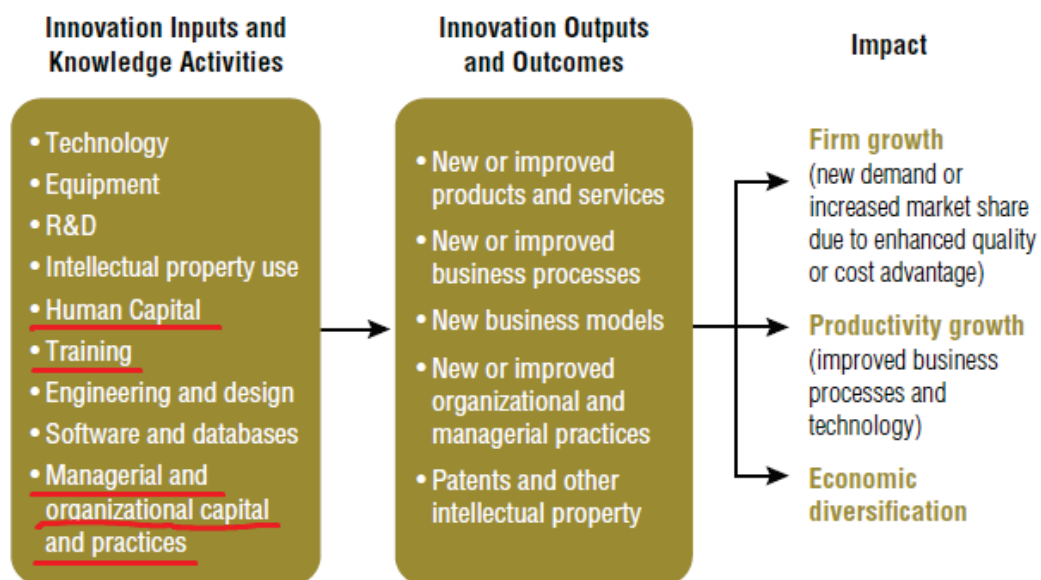
Imai sees innovation as a “major changes in the wake of technological breakthroughs” In his definition, innovation is dramatic.

However, as written in 1.3.1, there is numerous definition and facets of innovation so that depending on how you see innovation, the relationship with *Kaizen* is subject to change.

More recently some¹⁴ associate *Kaizen* with incremental innovation. Indeed, *Kaizen* is a set of incremental activities for improvement. Though each activity may not induce a significant change, the accumulation of these changes can add up to more visible and significant transformation.

Furthermore, accumulation of incremental *Kaizen* activities also helps develop the core capacity of workers. It forces each worker to think rigorously using statistical data, to solve actual problems that they are facing and to always have a *Kaizen* mindset. This itself enhances the capability of the firms which enables the firms to take innovative actions, experiment alternate ways, adopt new technology and hence achieve innovative outputs.

World Bank¹⁵ captures the extended concept of innovation in three stages. Innovation inputs and knowledge activities, innovation outputs and outcomes, and impact. (See Fig. 1.3-1)



Source: World Bank, modified by author

Figure 1.3-1 Function of Innovation

¹⁴ <http://www.innovationmanagement.se/imtool-articles/Kaizen-and-innovation/>

¹⁵ Xavier Cirera William F. Maloney (2017) *The Innovation Paradox: Developing-Country Capabilities and the Unrealized Promise of Technological Catch-Up*, The World Bank. <https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1160-9>

Since *Kaizen* is a management approach to enhance quality (firm growth in Fig. 1.3-1) and productivity, as much as an approach to enhance human capital, it can be said that *Kaizen* is one of the key elements of innovation inputs.

Furthermore, as *Kaizen* is a continuous activity to seek improvement in areas of quality of the products, efficiency in business processes and managerial practices, it is also a paramount process to achieve innovation outputs.

1.3.3 Firm Capabilities and *Kaizen*

There is an on-going discussion on why innovation are less likely to occur in developing countries compared to more advanced economies.

One of the theory is that there are lack of capabilities in the level of firms and the government to make innovation feasible.

While government level capabilities are related to their ability to formulate effective policies that support firm-level innovation, firm level capabilities are managerial and organizational practices that make innovation work. John Page¹⁶ defines firm capabilities as the “knowledge and working practices used by firms in the course of production and in developing new products.” Firm capabilities manifest itself in quality and productivity.

Innovation is unlikely to occur in firms where they lack these capabilities. In these firms, even if an entrepreneur comes up with a splendid innovative idea, it would be nearly impossible to transform the idea into a product. Furthermore, in order for the product to diffuse in a market, continuous effort of PDCA cycle regarding trying out the proto-types and modifying it to satisfy the market needs should be made. This process itself is the *Kaizen* activities which enhances the firm capability.

Hence, *Kaizen* can be seen as an approach to enhance firm capabilities.

¹⁶ upcoming

2. *Kaizen* Dissemination in Africa

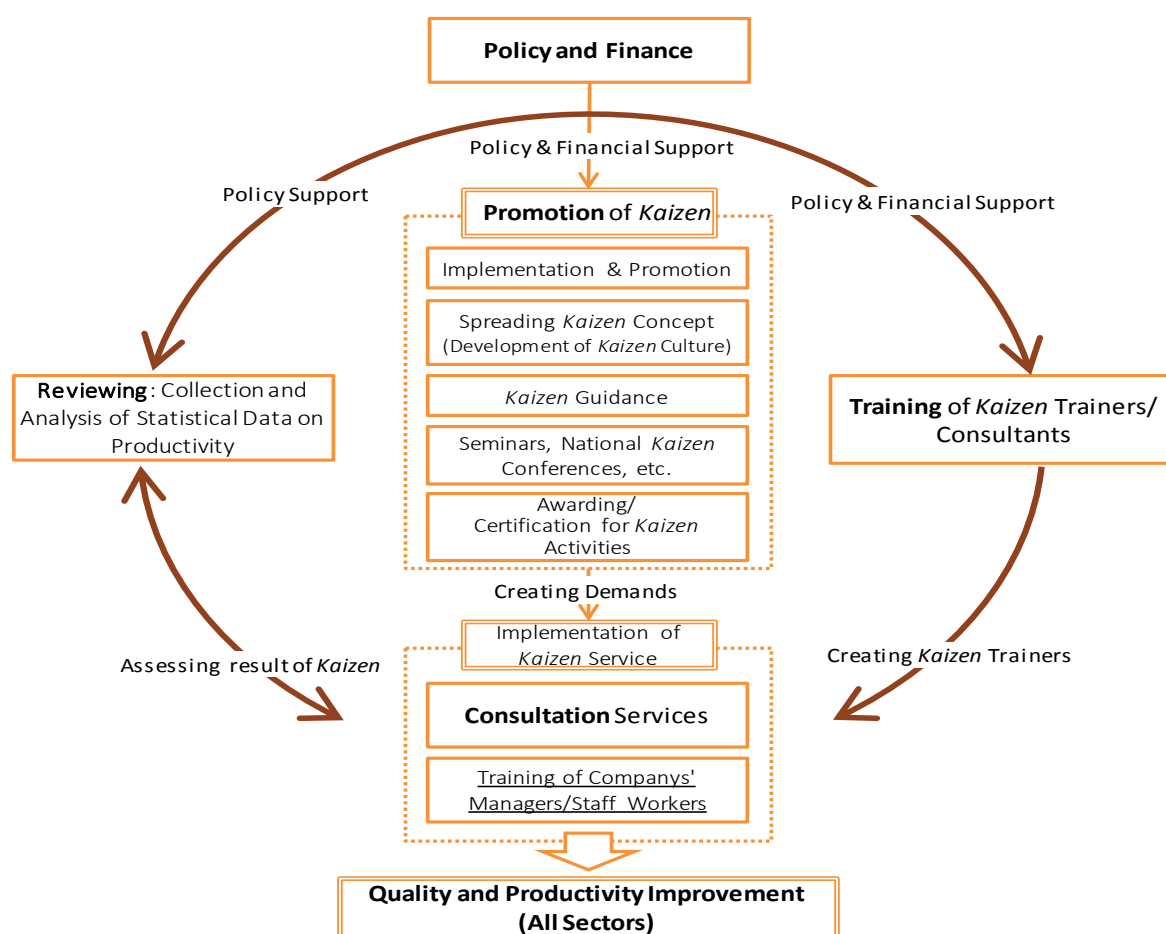
2. *Kaizen* Dissemination in Africa

2.1 System of *Kaizen* Dissemination

2.1.1 Fundamentals of Policy and System Development for *Kaizen* Dissemination

Kaizen has been disseminated under government leadership in many countries, although private organizations took the initiatives of the productivity movement and development of the Total Quality Control (TQC) in Japan; Japanese companies have implemented *Kaizen* company-wide on their own including when expanding their businesses overseas, and they hired foreign consultants if needed. In Africa, however, few companies and organizations can undertake such measures, considering the region's current industrial level. In addition, low management capability coupled with lack of recognition of the necessity and importance of improving it prevents the private sector from taking the initiative in *Kaizen* dissemination. In general, therefore, companies in many countries carry out *Kaizen* activities under the assistance of *Kaizen* promotion organizations within the framework of public support system.

In most countries, the government works on quality and productivity improvement with support measures which target companies and other organizations as a part of their industrial policy. However, it is not only the manufacturing industry that needs quality and productivity improvement; it is also required in the service industry and the public sector as well as in the daily lives of the general public. It is therefore important to spread *Kaizen* throughout the country by promoting changes in people's attitudes towards quality and productivity as a national movement. As demonstrated by examples of Singapore and Ethiopia, government-led dissemination and promotion of *Kaizen* can produce highly successful results.



Source: JICA Study Team

Figure 2.1-1 System of Activities Necessary for Promoting *Kaizen*

Most countries promoting *Kaizen* have more or less a similar system or framework of activities for dissemination, as illustrated in Fig. 2.1-1. As shown in the figure, a wider dissemination and popularization of *Kaizen* can be achieved by promoting a series of activities necessary for continuously disseminating *Kaizen* nationwide and implementing them in effective and integrated way. Therefore, countries opting for promoting *Kaizen* need to develop appropriate organizations and systems to implement these activities systematically. Activities required are outlined in the following sections.

2.1.1.1 Financial and Policy Support by Relevant Government Agencies

The first steps towards nationwide dissemination of *Kaizen* involve selection of organizations responsible for development of systems and mechanisms that support *Kaizen* activities, and securing and training of human resources (*Kaizen* Trainers). To proceed with these steps, the government (parent ministries and offices or higher authorities of *Kaizen* promotion organizations) need to implement policies to support *Kaizen* promotion, and to financially support operations and activities of *Kaizen* promotion organizations. This cannot be

realized without thorough understanding, cooperation, and demonstration of strong leadership of high-ranking government officials towards *Kaizen* dissemination.

With government support, *Kaizen* promotion organizations need to develop strategies and plans for *Kaizen* dissemination and secure approval from the government. It is crucial that their strategies and plans are aligned with the framework of the country's national development plan, which can effectively help *Kaizen* to spread widely and deeply throughout the country. Positioning of *Kaizen* in the national development policy determines the direction of the country's *Kaizen* deployment such as which sectors, types of businesses, or business sizes to target. In countries like Zambia, for example, where the national plan clearly states the country's commitment to quality improvement in all sectors, the target is businesses in all sectors including the manufacturing sector, the service sector and the public sector regardless of their sizes. In Tanzania, on the other hand, the manufacturing sector is their target, and several organizations, each of which supports companies of different sizes, are responsible for *Kaizen* promotion.

In the process of developing a framework of a *Kaizen* dissemination system, it is important for *Kaizen* promotion organizations to establish detailed and effective action plans in line with the framework of the country's national development plan and industrial policies. Indicating relevance of these actions with national agenda and expected benefits is also necessary to attract the interest of high-ranking government officials.

2.1.1.2 Dissemination Activities by *Kaizen* Promotion Organizations

Although *Kaizen* promotion organizations mainly undertake activities based on the strategies and plans prepared as mentioned in 2.1.1.1, dissemination of *Kaizen* also requires each individual and company to carry out *Kaizen* activities to improve quality and productivity, and enhance firm capabilities and industrial competitiveness. Furthermore, effectiveness of *Kaizen* activities needs to be recognized, implemented widely and continuously as common practice to establish *Kaizen* culture. In other words, creation of *Kaizen* culture through the activities to disseminate and raise awareness about *Kaizen*, as shown in the Fig. 2.1-1 is crucial for *Kaizen* dissemination as a national movement throughout the country. To this end, *Kaizen* promotion organizations should start with communicating information and raising awareness about the concept and significance of *Kaizen* to the general public, using popularization tools such as TV, radio, newspapers, bulletins, Internet, social networking service (SNS), and government-organized events.

Kaizen promotion organizations have to organize conferences and seminars on *Kaizen* for companies and organizations as well as offer training and consulting service on it to them on a pilot basis. It is important, particularly in the introductory phase, to raise awareness of *Kaizen* by increasing opportunities for people and companies to acquire knowledge on *Kaizen*. In light of this, offering these services free of charge or at a low cost is effective for future marketing purposes. Another effective measure to spread *Kaizen* culture in companies and increase

awareness on *Kaizen* is to organize a *Kaizen* Conference to commend excellent companies and *Kaizen* Trainers¹.

Certification systems for *Kaizen* consultants, which have been introduced in Argentina, Ethiopia and other countries can serve as an indicator to help companies to choose right *Kaizen* services, and therefore help disseminate *Kaizen*. These promotion activities by *Kaizen* promotion organizations not only increase awareness of *Kaizen* but also arouse public interest, serving as a promotional campaign to create demand for *Kaizen* in potential client companies and organizations. Table 2.1-1 shows *Kaizen* promotion organizations and their structures in the countries which were studied in the JICA research project.

Table 2.1-1 List of Major *Kaizen* Promotion Organizations and their Structures in the Countries Studied

	<i>Kaizen</i> Promotion Organizations	Ministry	Roles and Targets
Cameroon	<ul style="list-style-type: none"> Small and Medium-Sized Enterprises Promotion Agency: (APME) 	Ministry of Small and Medium-sized Enterprises, Social Economy and Handicrafts: (MINPMEESA)	<ul style="list-style-type: none"> Offering BDS to micro, small and medium-sized enterprises (MSMEs) in all sectors
Ethiopia	<ul style="list-style-type: none"> Ethiopia KAIZEN Institute (EKI) TVET Institutes KAIZEN Regional Institutes 	Ministry of Public Service and Human Resource Development: (MPSHRD) Ministry of Education Regional Government	<ul style="list-style-type: none"> Aiming to disseminate and spread <i>Kaizen</i> in all sectors nationwide EKI supports medium and large-sized enterprises (organizations) while TVET institutes support micro and small ones.
Egypt	<ul style="list-style-type: none"> Productivity and Quality Improvement Center (PQIC) 	Ministry of Trade and Industry (MTI)	<ul style="list-style-type: none"> Quality improvement of exporters, mainly medium and large-sized manufacturing businesses, is part of MTI's industrial policies.
Ghana	<ul style="list-style-type: none"> National Board for Small Scale Industries (NBSSI) NBSSI Regional Office Management Development and Productivity Institute (MDPI) 	Ministry of Trade and Industry (MTI)	<ul style="list-style-type: none"> Providing BDS mainly for micro and small-sized enterprises and some medium-sized enterprises
Kenya	<ul style="list-style-type: none"> Kenya Institute of Business Training (KIBT) National Productivity and Competitiveness Centre (NPCC) 	<ul style="list-style-type: none"> Ministry of Industry, Trade and Cooperatives (MITC) Ministry of East African Community, Labour and Social Protection (MEACLSP) 	<ul style="list-style-type: none"> KIBT provides BDS for MSMEs as their target beneficiaries. NPCC, an agency under MEACLSP, administers productivity improvement programs across all sectors.
Tanzania	<ul style="list-style-type: none"> Tanzania KAIZEN Unit (TKU) Small Industries Development Organization (SIDO) College of Business Education (CBE) Department of Industrial Development (DID) 	Ministry of Industry, Trade and Investment (MITI)	<ul style="list-style-type: none"> SIDO supports MSMEs. DID supports the manufacturing industry, including large enterprises. Therefore, their target beneficiaries are manufacturing businesses of all sizes.

¹ Malaysia Productivity Corporation (MPC), a corporation that promotes 5S as the foundation of productivity improvement, evaluates the attainment of 5S in companies on a grade of one to five based on six criteria. Companies that meet the required standards receive a 5S certification, which is valid for one year. To expand the country's pool of human resources capable of quality and productivity improvement, MPC also has a program called the Productivity Champion, which recognizes private consultants and other experts in the field, or persons who play a leadership role in improving quality and productivity in companies which undertake improvement efforts.

	<i>Kaizen</i> Promotion Organizations	Ministry	Roles and Targets
Tunisia	<ul style="list-style-type: none"> Unité de Gestion du Programme National de Promotion de la Qualité en Tunisie: (UGPQ) Centre Technique des Industries Mécaniques et Electriques: (CETIME) Centre Technique de l'Emballage et du Conditionnement: (PACKTEC) Centre Technique du Textile: (CETTEX) Centre Technique de la Chimie: (CTC) 	Ministère de l'Industrie et du Commerce	<ul style="list-style-type: none"> MIC's policy is to help medium and large-sized enterprises (in the manufacturing sector) to enhance their quality and export competitiveness, as they try to expand into the EU market. Target beneficiaries are mainly medium and large-sized manufacturing businesses.
Zambia	<ul style="list-style-type: none"> KAIZEN Institute of Zambia (KIZ) 	Ministry of Commerce, Trade and Industry (MCTI)	<ul style="list-style-type: none"> The country's national plan states that it seeks quality improvement in all sectors. Target beneficiaries are organizations of all sizes.
Argentina	<ul style="list-style-type: none"> Instituto Nacional de Tecnología Industrial (INTI) 	Ministerio de Producción	<ul style="list-style-type: none"> Aiming at quality and productivity improvement in the manufacturing sector, including SMEs
Costa Rica	<ul style="list-style-type: none"> National Technical University -Technical Instructor and Personnel Training Center (UTN-CECAPRO) (Former: CEFOF) 	-	<ul style="list-style-type: none"> Paid training and consulting services are provided for all sectors. Technical assistances are conducted for El Salvador and Dominican Republic.
Malaysia	Malaysia Productivity Corporation (MPC)	Ministry of International Trade and Industry (MITI)	<ul style="list-style-type: none"> Since the establishment of MPC's predecessor, the National Productivity Corporation (NPC) in 1962, the government has conducted productivity improvement programs. Quality and productivity improvement is always included in the government's five-year plans.
Singapore	<ul style="list-style-type: none"> SPRING Singapore (Standards, Productivity and Innovation Board) Singapore Productivity Association (SPA) Singapore Productivity Centre (SPC) Singapore Innovation & Productivity Institute Pte. Ltd. (SIPi) 	Ministry of Trade and Industry (MTI)	<ul style="list-style-type: none"> Under the leadership of the late Prime Minister Lee, the Productivity Movement started in the early 1980s. Since then, the country has been actively promoting government-led human resources development for industry. The current government is aiming to internationalize SMEs and promote shifts towards higher value-added sub-sectors. The government has been actively offering subsidies for businesses since the launch.
Thai	<ul style="list-style-type: none"> Thailand Productivity Institute (FTPI) 	Ministry of Industry (MOI)	<ul style="list-style-type: none"> FTPI is an organization that oversees the country's productivity improvement movement, providing programs and consulting for many organizations, including private enterprises.
Japan	<ul style="list-style-type: none"> Japan Productivity Center (JPC) Union of Japanese Scientists and Engineers (JUSE) Japan Institute of Plant Maintenance (JIPM) 	-	<ul style="list-style-type: none"> Each of the financially independent organizations listed to the left hand side works on dissemination and promotion on <i>Kaizen</i>.

Source: JICA Study Team

2.1.1.3 Training of *Kaizen* Trainers

In parallel with disseminating *Kaizen* nationwide through seminars and various publicity tools to stimulate demand for *Kaizen*, it is necessary to train *Kaizen* Trainers who are capable of providing *Kaizen*-related services to meet the demand created. They are either employees of *Kaizen* promotion organizations or private consultants who have completed training conducted by *Kaizen* promotion organizations. In addition to theoretical knowledge², they need to have

² See Tables 3.3-1 and 3.3-2 in the next chapter for details about skills expected of KAIZEN Trainers.

appropriate practical skills that could allow them to provide consulting service at workplaces in companies and organizations interested to implement *Kaizen*. Therefore, candidates for *Kaizen* Trainers need to acquire theoretical knowledge through Classroom Training (CRT) and practical skills through In-Company Training (ICT). Knowledge about quality and production management including *Kaizen* can be acquired at higher education institutions, vocational schools or other institutions. However, practical *Kaizen* methods and techniques can only be acquired by applying them in practice through ICT, and it is important to ensure that prospective *Kaizen* Trainers should gain as much hands-on experience as possible and acquire practical skills that could allow them to deal with various *Kaizen* issues.

The levels of *Kaizen* techniques and areas of BDS required in a country vary depending on the level of industrial development. For this reason, it is advisable to determine the scope of trainings as well as to develop and enhance the contents (textbooks, manuals, guidelines, curriculums, etc.) based on the needs of industries and companies. Since there are two types of *Kaizen* Trainers—those belonging to public agencies and those in the private sector—countries promoting *Kaizen* should provide strategic training for them, taking into account the roles they expect each of them to play in providing consulting services (e.g. which levels of *Kaizen* guidance each provides, and which sectors, which business sizes, and/or which regions each supports). As will be discussed further under “2.2.2.2 Initiative to Promote *Kaizen* during the Full-fledged Stage”, while public agencies provide prescribed support services that have high public value, private *Kaizen* Trainers have greater flexibility in the range of services they can offer and agility in service delivery. The latter can target large enterprises and those in sectors which are not selected by the government as priority sectors as well. There are also some cases where private *Kaizen* Trainers are dispatched to provide consulting service on behalf of public *Kaizen* promotion organizations when budgetary constraints prevent them from hiring the necessary number of *Kaizen* Trainers as full-time staff.

2.1.1.4 Support for Businesses (Consulting Service)

After creating some level of demand for *Kaizen* through dissemination and awareness creation activities, *Kaizen* Trainers provide consulting service on *Kaizen* for companies and other organizations. *Kaizen* activities are conducted not through unilateral efforts of *Kaizen* Trainers but through concerted team efforts among the top management, employees, and *Kaizen* Trainers. To implement *Kaizen* activities more effectively and ensure that it takes root in implementing organizations, *Kaizen* Trainers should conduct training on *Kaizen* to the top management, middle management, and employees. During the training, it is important to ensure that employees develop a mindset to think about and conduct *Kaizen* activities on their own initiative and that the management commit themselves to support the activities³.

³ See the sections “3.8 Training of Intra-Firm Human Resources for *Kaizen*” for details.

Kaizen promotion organizations should organize events such as *Kaizen* promotion seminars, *Kaizen* conferences, and ceremonies for awards programs to share outcomes of *Kaizen* with the general public. In recent years, since *Kaizen*'s reputation often spreads through SNS or word of mouth from one company to another, it is also important to have a mechanism to encourage such voluntary promotion activities as seen at the establishment and operation of a social group called KAIZEN Club in Zambia⁴.

2.1.1.5 Collection, Analysis and Release of *Kaizen* Data

Outcomes of *Kaizen* activities implemented in companies need to be collected and analyzed to see how *Kaizen* activities have made an impact on business in each *Kaizen* implementing company. It is also important to sort those data by industry and business size to provide the government, the private sector, and the general public with the information on the contribution of *Kaizen* dissemination to the country's economic growth and national welfare. Establishing indicators to collect, analyze and record outcomes on productivity and business performance could help each industry and company to set goals and benchmarks to refer to. The benchmarks could further encourage to maintain and sustain continuous *Kaizen* activities and motivate companies striving to meet them.

Data on *Kaizen* outcomes released by *Kaizen* promotion organizations should be as quantitative as possible for easier understanding on the degree of the impacts. This, however, can only be achieved if *Kaizen* promotion organizations have a mechanism and capability to collect and accumulate reliable data. In addition to quantitative outcome data, it is also important to study and compile qualitative outcomes at the company level, such as change in employees' mindset, attitude and mentality as well as customer satisfaction levels.

The activities described above are expected to scale up dissemination of *Kaizen*, ultimately improving the quality and productivity of companies and industries, and enhancing the country's industrial and export competitiveness. Furthermore, growth and expansion of industries achieved through *Kaizen* activities are expected to promote the start-up of businesses and creation of new employment opportunities and decent work. It is difficult to measure how much impact *Kaizen* activities have directly made for the enhancement of industrial competitiveness and decline in the unemployment rate as well as the country's GDP growth. However, *Kaizen* promotion organizations should encourage as many companies as possible to implement *Kaizen* and accumulate data on *Kaizen* effects quantitatively to present visible results (For instance, EKI indicated that *Kaizen* activities have produced outcomes worth more than 100 million dollars in five years). These visible benefits lay the foundation for providing policy and financial support for further promotion of *Kaizen*. These activities also can help *Kaizen* promotion organizations to enhance their institutional capacity, achieve social recognition and build credibility. The activities described above could be conducted more extensively and intensively throughout society

⁴ See the Case 3 "Establishment of KAIZEN Club in Zambia and process of its autonomous management" in Appendix 2.

when done in collaboration with a wide range of stakeholders including government-affiliated organizations, municipalities, trade associations (manufacturers' associations, chambers of commerce and industry, etc.), educational institutions (universities, research institutes, vocational schools, etc.), financial institutions and private consultants. Therefore, it is advisable to build positive and strategic partnerships with such stakeholders (see 3.10).

2.1.2 Commitment of the Government to *Kaizen* Dissemination

During the introduction stage of *Kaizen* promotion, it is not easy to create and repeat the cycle of the activities shown in Figure 2.1-1, because *Kaizen* promotion organizations need to promote these activities with their limited resources. To allow them to continue their efforts, it is crucial that the government takes the initiative to support these activities, and show its commitment in actions described below.

2.1.2.1 Selection of *Kaizen* Promotion Organizations

One of the first areas where the government demonstrates their commitment is in the selection of *Kaizen* promotion organizations which lead *Kaizen* promotion (see Table 2.1-1). *Kaizen* promotion organizations can be new organizations established specifically for *Kaizen* promotion, or the government can assign a new task—dissemination of *Kaizen*—to existing SME support organizations (organizations that provide BDS) or technical assistance organizations. Decisions on *Kaizen* promotion organizations should be in line with policies and development agenda of the country. Therefore, the following items on *Kaizen* promotion organizations should be considered.

<Items for Consideration>

- a) Selection of ministries/agencies that oversee *Kaizen* promotion organizations
- b) Consistency with industrial policies and SME promotion policies
- c) Vision, mission, strategy, plan, etc. of the organizations
- d) Organizational structure (staff, office, financial and other resources)
- e) Legal status
- f) Operations (objectives and roles) and plans
- g) System of monitoring their activities and outcomes
- h) Continuance of the organizations and their operations (i.e. whether to make them permanent organizations or temporary ones), and
- i) Stakeholders (educational institutions, research institutes, industrial associations, etc.) and partnership with the private sector.

2.1.2.2 Budget

Another important area is budgetary measures. For *Kaizen* promotion organizations, securing a budget to enable their operations is a critical issue. In developing countries in general, dissemination of *Kaizen* is not sufficiently funded, which has, in many cases, disrupted operations

of *Kaizen* promotion organizations. They cannot easily secure a sufficient budget when *Kaizen* promotion has yet to produce tangible results. Even if they secure a small budget, most of it goes to administrative expenses or personnel costs, and funds available for *Kaizen* promotion activities is limited. Because of the status of *Kaizen* promotion organizations as public organizations, fees they can charge for consulting service or seminars is capped in view of their public nature. This, in some cases, prevents *Kaizen* promotion organizations from obtaining funds on their own and becoming financially independent.

Therefore, the government needs to implement systems to ensure that *Kaizen* promotion organizations can implement *Kaizen* activities and produce clear-cut outcomes and to monitor their impact on the national economy and industries, including economic effect, human resources development, and creation of employment opportunities and enhancement of industrial competitiveness. Based on these outcomes, the government should allocate appropriate funds to *Kaizen* activities to support them in the next budget cycle.

If it is not possible to secure a sufficient budget to promote *Kaizen*, funds may be raised by asking donors to bear expenses for *Kaizen* promotion activities or by charging beneficiaries for consulting service or seminars, namely companies or participants who receive such services, or to cover the cost with government subsidies. Directly allocating a budget to *Kaizen* promotion organizations is not the only way in which the government can financially support *Kaizen* promotion. The government can indirectly support them by improving access to financial resources or establishing necessary policies and legal systems.

2.1.2.3 Leadership

For countries trying to promote *Kaizen* for the first time, commitment of the government is vital. Above all, strong leadership of high-ranking government officials including the prime minister and related ministers is of great help in awaking the general public about *Kaizen* and spreading it throughout society as well as in incorporating *Kaizen* into national policies.

In Singapore, which has successfully introduced *Kaizen*, for example, credit should go to the late Prime Minister Lee Kuan Yew. Under his direction, the country launched the “Learn from Japan” Campaign in 1981 based on the recognition that the island country that had achieved rapid economic development after the war was the best role model. They disseminated *Kaizen* throughout the country as a part of the program. Major factors that enabled successful *Kaizen* introduction and modernization were policies of the country that consistently supported the move under the leadership of the Prime Minister. In Ethiopia, public discussions including high government officials were held through policy dialogues with the National Graduate Institute for Policy Studies (GRIPS) of Japan. This dialogue was actualized by the strong political leadership of the late Prime Minister Meles Zenawi and his successor Prime Minister Hailemariam Desalegn. Their strong interest in *Kaizen*, resulted in the incorporation of *Kaizen* dissemination into national development plans.

As these examples illustrate, strong leadership of prime ministers, ministers and other high-ranking officials as well as their interest and understanding can lead to extensive and intensive spread of *Kaizen* through national policies that reflect their commitment.

【Box 1】 Introduction of *Kaizen* and Subsequent Development in Singapore

Kaizen dissemination in Singapore started in 1981, when the National Productivity Board (NPB), an organization established under the Economic Development Board, intensified its efforts to lead a productivity movement that incorporated Japanese labor management and productivity improvement methods. This was initiated by the then Prime Minister Lee Kuan Yew, who announced a policy of developing a skilled workforce for industry as part of a measure to promote the country's economic growth by following the productivity improvement movement in Japan, which has achieved remarkable growth.

In response to this, JICA launched the Productivity Development Project in Singapore in 1983, which was extended over a period of seven years, including its follow-up work. Among those who completed training in the project, approximately 30 of them served as *Kaizen* Trainers to provide assistance for local companies. After the conclusion of the project, the country continued consulting service for a fee. However, approximately 50% of the charges were covered by government subsidies and therefore many companies used the service. The productivity movement reached its peak around 1993, when the Productivity Standard Board (PSB) was established after the NPB's reorganization, and PSB started providing various kinds of BDS, including *Kaizen*-related service.

As the PSB grew into a large organization, with almost 1,000 staff members at one point to provide a wide range of BDS, the government reorganized it in 2002 into several organizations including the Standards, Productivity and Innovation Board (SPRING Singapore) as a policy development body, and PSB Corporations as service providers. Around this time, the government of Singapore shifted its priority from productivity improvement to promotion of innovation in accordance with changes in the country's industrial structure and the level of economic development. However, productivity of most SMEs still requires improvement.

After the reorganization of the PSB, the newly established policy development body SPRING remained as a national agency, while the organizations to provide *Kaizen* service were separated and privatized as PSB Corporations. This arrangement has led PSB Corporations to start providing a Singaporean version of *Kaizen* by customizing what they learned through the JICA project and providing a combination of various BDS services.

PSB Corporations were later dissolved and the country now has a reformed system where service is provided through cooperation between SPRING and various partner organizations. PSB Corporations, as private entities, quickly responded to needs of companies and involved private consultants in the process of developing and providing various services. This experience is one of the reasons why SPRING is able to collaborate smoothly with various partner organizations even after the system reorganization, and a wide range of SME support services are still available today in Singapore.

【Box 2】 Start-up of an *Kaizen* Promotion Organization in Ethiopia (EKU, now EKI)

After participating in the Fourth Tokyo International Conference on African Development (TICAD IV) in Yokohama in May 2008, Meles Zenawi, the then Prime Minister of Ethiopia, requested assistance from the Japanese government for the country's industrial development in July of the same year at the Africa Task Force Meeting of the Policy Dialogue Initiative in Addis Ababa. In response to this, two projects started in 2009: Japan-Ethiopia industrial policy dialogue, and technical cooperation for development planning.

The launch of these cooperation projects brought about discussions on establishing a KAIZEN Unit (now EKI) in

Ethiopia under the leadership of the late Prime Minister Meles Zenawi. As part of this move, Ethiopia studied experience of the SPRING Singapore as a successful model case, which is the successor of the NPB, an organization Japan had supported to improve the country's productivity through *Kaizen* from 1981. After being particularly inspired by the Singaporean government's commitment to the productivity improvement movement, a national movement that highlighted the necessity of instilling the philosophy of *Kaizen* into the mind of every citizen, Ethiopia made steady efforts to disseminate *Kaizen* as a national movement. The first Director General of EKI, Mr. Getahun Tadesse worked with great determination and strategies, which contributed to the successful dissemination of *Kaizen* in Ethiopia.

Mr. Getahun focused on the following four activities for dissemination of *Kaizen*:

- 1) Ten people were hired from sector-based technical centers under the Ministry of Industry (some of them were on borrowing from the centers) to establish the KAIZEN Unit.
- 2) As part of the technical cooperation project, these ten people were trained by experts from Japan to learn knowledge and methods of *Kaizen* and to form core members for *Kaizen* dissemination.
- 3) Japanese experts worked on 30 companies to help them to ingrain *Kaizen* activities and also to train the ten *Kaizen* Unit members through CRT and ICT. The outcomes were reported through extensive mass media campaigns.
- 4) A vision for dissemination of *Kaizen* in Ethiopia was developed and established as a national policy.

Focus on building of institutional foundation, campaigns for raising awareness about *Kaizen*, and development of dissemination plans at the beginning led to winning commitment from government leaders and JICA for *Kaizen* promotion, which then enabled further institutional development and expansion of the unit. The ten members of the unit who were trained by Japanese experts not only acquired *Kaizen* methods, but implemented promotion activities, wide public relations activities, establishment of dissemination networks involving their home organizations (technical centers), training of pilot enterprises in collaboration with technical centers, and development of dissemination plans. Everyone's combined efforts for the establishment of EKI have contributed to the strengths of EKI as an organization and successful outcomes of the dissemination of *Kaizen* in Ethiopia today.

The examples of Singapore and Ethiopia outlined above are cases where high-ranking government officials embraced *Kaizen* and took initiative to support it. However, prime ministers and ministers in other countries may not select *Kaizen* on their own initiative from all the different industrial policies or adopt it as a national policy. Therefore, the key is how to approach high-ranking government officials to seek support for *Kaizen*. As discussed in "2.1.1.5 Collection, Analysis and Release of *Kaizen* Data," it is important to establish mechanisms to analyze and evaluate outcomes of *Kaizen* activities both quantitatively and qualitatively and to regularly report the findings to high-ranking government officials. Expressing the impact of *Kaizen* in monetary value or other easy-to-understand indicators, as is practiced in Ethiopia, in particular, can help high-level government officials to clearly explain to the public and tax payers the significance of incorporating *Kaizen* into national policies and actively promoting it as a government-led business support program. Further, by gaining public understanding and support, they can promote *Kaizen* with greater confidence and leadership.

2.2 Points of *Kaizen* Dissemination by Stages

Stages of system development for *Kaizen* promotion activities can be divided into "Introduction Stage", "Dissemination Stage" and "Full-fledged Stage". The degree of importance and priority of the activities shown in Figure 2.1-1 during the introduction stage are different from those during the full-fledged dissemination stage. The following key points are important to consider at each stage.

Introduction Stage	: Trial period with limited resources
Dissemination Stage	: Dissemination through appropriate human resource, organization, systems and policies
Full-fledged Stage	: Utilization of private sector resources, securing financial independence as a program

2.2.1 Key Points during the Introduction Stage of *Kaizen* Promotion

During the introduction stage of *Kaizen* dissemination, it is likely that *Kaizen* activities are conducted on a pilot basis, making the most of limited resources. To spread *Kaizen* nationwide, it is important to produce tangible results step by step based on a plan, instead of trying to do everything extensively and aggressively at one go.

2.2.1.1 Narrowing of the Scope of *Kaizen* Service

During the introduction stage, it is important to limit the scope of *Kaizen* promotion to strategic areas that are expected to produce tangible results instead of abruptly extending activities to a wide range of sectors, types of business, number of companies and regions even if *Kaizen* win high expectations. It is effective to narrow down targets to specific industries (e.g. export industries or priority industries in line with industrial policies, or manufacturing sector), specific sizes of businesses or industries (e.g. micro, small and medium-sized enterprises), or specific regions (e.g. commercial city areas in the country). *Kaizen* should be promoted in line with national development policies, industrial policies and other targets, as mentioned above.

2.2.1.2 Implementation of *Kaizen* by Companies and Accumulating Best Practices

Pilot enterprises will be selected based on the indicators shown in "Table 3.5-1 Pilot Company Evaluation Sheet (Example)". During the introduction stage, it is advisable to select companies and *Kaizen* themes that can be expected to yield visible, and immediate results. This is because producing outcomes from 5S, *Muda-dori*, Visual Control and other *Kaizen* efforts that can produce results in a relatively short period of time, and accumulating these achievements help companies (both the management and employees) and *Kaizen* Trainers to develop confidence and enhance their motivation.

On the other hand, *Kaizen* assistance to eliminate bottlenecks that inhibit quality and productivity improvement in companies could take a relatively long period of time, making it

relatively difficult to maintain motivation particularly for companies that have not yet established *Kaizen* culture. Therefore, it is important to first accumulate achievements through incremental tangible results. Once *Kaizen* efforts have started to produce results, and companies and *Kaizen* Trainers have established a stable relationship of trust, they should discuss and build a consensus about how to approach the bottlenecks, and then gradually shift their focus to problem-solving.

2.2.1.3 Release of Outcomes of *Kaizen*

It is important to record achievements made through *Kaizen* activities as model cases, and share them with relevant parties. For example, the model cases can be used to introduce best practice to the audience at seminars and conferences or to other companies, or they can be used for the training of *Kaizen* Trainers. It is advisable to use them for horizontal deployment of *Kaizen*. In addition, it is imperative not only to study outcomes of model companies on an individual basis but also to compile cumulative outcomes of all the enterprises to quantitatively analyze the ultimate impact (each company's business performance, export competitiveness, creation of employment opportunities, etc.). It is also important to do the same on qualitative aspects, including changes in mindsets, attitude towards work, mentality and customer satisfaction, and report the findings to high-ranking government officials through ministries or agencies which supervise *Kaizen* promotion organizations. These findings can help the government officials to recognize benefits and importance of *Kaizen*, discuss further support for *Kaizen* promotion in the next budget cycle or financial year, and thereby stimulate the government's commitment to policy, and financial support for continuous *Kaizen* dissemination.

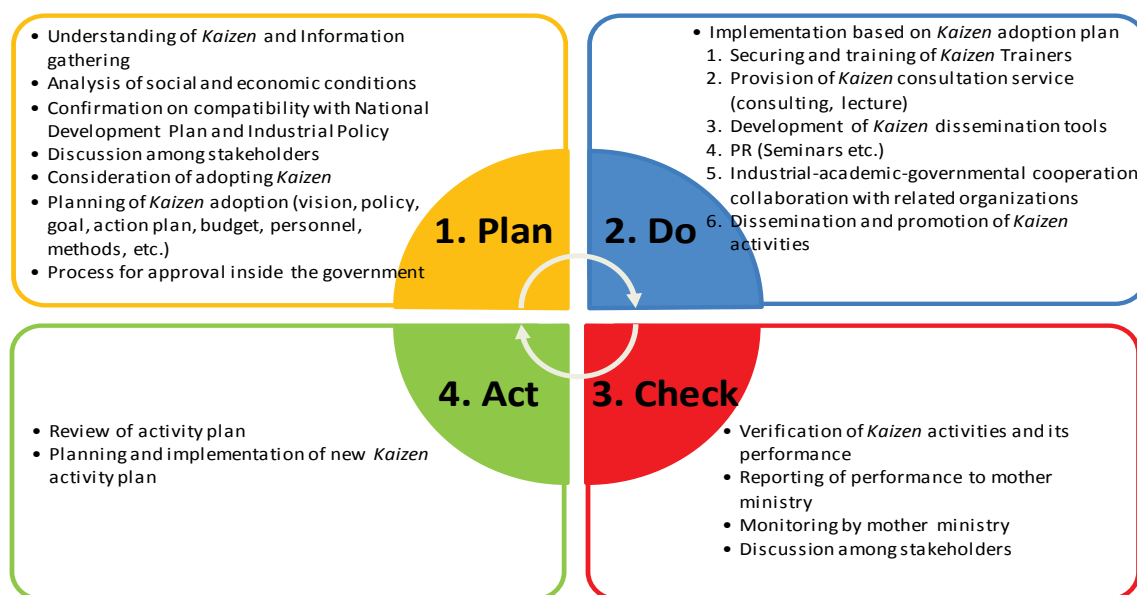
2.2.2 Key Points during the Dissemination Stage and the Full-Fledged Stage

2.2.2.1 Further Promotion of *Kaizen* and Review of Activities during the Dissemination Stage

Since all activities for disseminating and promoting *Kaizen* have been implemented during the introduction stage, high priority areas during the dissemination stage among the activities are to significantly increasing the demand for *Kaizen*, meeting the demand, and to train *Kaizen* Trainers who can provide more advanced *Kaizen* techniques. To achieve them, it is crucial to establish a self-sustaining system for training of trainers (ToT), which continuously trains *Kaizen* Trainers.

Some of the important points during the shift from the introduction stage are to become more conscious of a vision of the future *Kaizen* deployment in the country and to revise implementation policies and activity plans appropriately based on outcomes obtained by then. While various tools can be used for verification of *Kaizen* promotion and reviewing of *Kaizen*

promotion plans, the simplest and most reliable approach is to apply the PDCA cycle⁵ in a series of planning, implementing, checking and revising policies and activities.



Source: JICA Study Team

Figure 2.2-1 Verification of *Kaizen* Dissemination through PDCA Cycle

2.2.2.2 Initiative to Promote *Kaizen* during the Full-fledged Stage

During the introduction and dissemination stage, *Kaizen* promotion organizations, which are public entities, spearhead dissemination of *Kaizen*. The full-fledged stage to disseminate *Kaizen* widely comes next, once the foundation for dissemination such as human resources, organizations, and systems has developed in the course of activities in the introduction stage and dissemination stage. In the full-fledged stage, collaboration with the private sector becomes indispensable.

On the other hand, *Kaizen* dissemination by the private sector has some difficulty; few local companies in Africa can afford consulting fees for *Kaizen*. Moreover, in the African business climate where, for example, people choose price over quality and the level of quality required is not very high, quality improvement is not seen as an urgent issue, and therefore some local companies do not feel the need to pay such consulting fees. Promoting *Kaizen* only through activities of private organizations is therefore difficult in developing countries where industries have not been fully developed.

Given this situation, it is desirable that the government should encourage the private sector to get actively involved in their effort in disseminating *Kaizen* to create demand for *Kaizen*-related service. Also, as public organizations lack funds to keep hiring a large number of *Kaizen*

⁵ PDCA (plan-do-check-act) cycle: A tool to help smooth the implementation of production management, quality control, and other business processes, by repeating the four stages of “plan,” “do,” “check” and “act” to ensure continuous business improvement.

Trainers, they need to establish a system to outsource some of their operations to the private sector and develop *Kaizen* dissemination structure that effectively utilizes private-sector capabilities.

Although, in many countries, public agencies have led dissemination of *Kaizen*, there are some cases where organizations and *Kaizen* Trainers in the private sector spearhead it. In Paraguay, the Paraguayan Quality and Productivity Center (CEPPROCAL) was established in 2007 under the Paraguayan Industrial Union (UIP) to conduct private sector-led *Kaizen* promotion. Cameroon trained private *Kaizen* Trainers since 2015 in addition to those belonging to Small and Medium-Sized Enterprises Promotion Agency (APME) and other public agencies. Selected private *Kaizen* Trainers underwent training after which they provide consulting service for companies and organizations. Other countries, including Argentina, Tanzania and Kenya, also train some private *Kaizen* Trainers and building public-private partnerships while at the same time making efforts to train those from public agencies. Mobilization of the private sector for *Kaizen* activities so far has the following characteristics:

<Characteristics of private sector mobilization for *Kaizen* dissemination >

- a) Philosophy and top executive posts in private organizations are not as susceptible to the influences of government budgets or political factors as those in the public sector.
- b) Unlike government agencies, private organizations, which are under fewer legal restrictions, can use their own discretion in deciding on consulting fees and training contents. This enables them to flexibly accommodate private companies' situations and requests.
- c) Private organizations can provide types of technical services that cannot be offered by public organizations.
- d) Private organizations have fewer budgetary constraints than public organizations, which allows them to run public relations campaigns more actively.
- e) When networks of public organizations are not fully developed, private organizations can provide service in regions that are not covered by public service.
- f) Since they are financially independent and do not receive public funding, members of private organizations are aware of the necessity for self-sustaining growth of their organizations. Therefore, they are highly motivated to expand their businesses for survival of their organizations.
- g) Because they offer consulting service as a business, they can charge higher fees for their technical assistance.

3. *Kaizen*-related Human Resource Development System

3. *Kaizen*-related Human Resource Development System

3.1 Qualifications for *Kaizen* Trainers

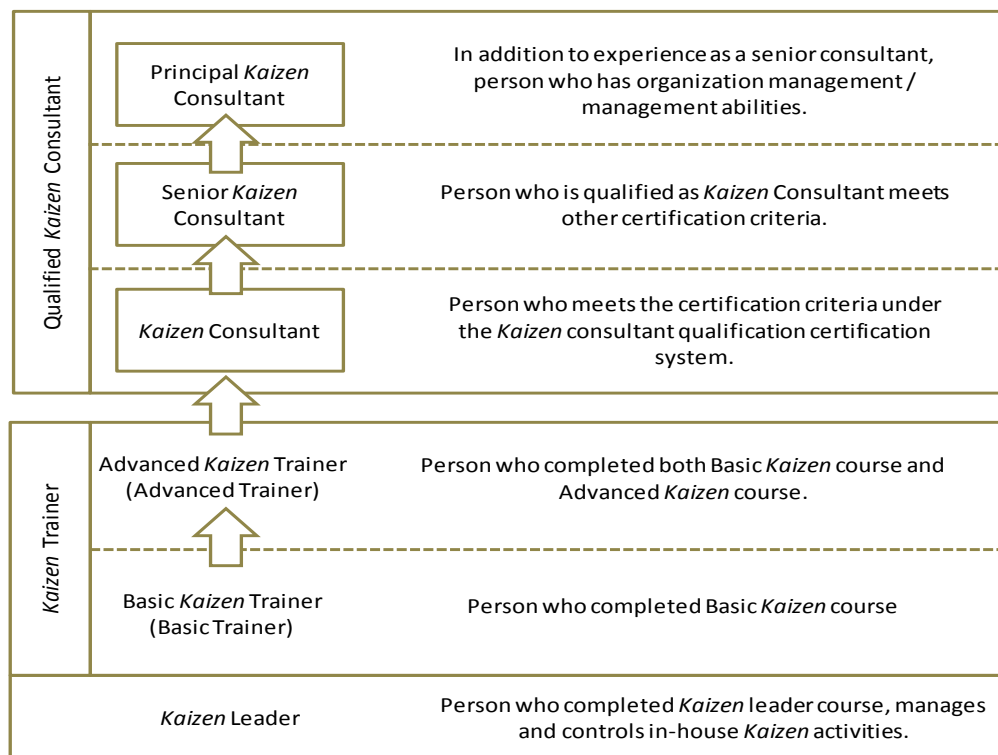
3.1.1 *Kaizen*-related personnel and career path

This handbook proposes training two levels of personnel who provide training and consulting service for companies: *Kaizen* Trainers and Qualified *Kaizen* Consultants.

Kaizen Trainers are personnel who have completed *Kaizen* Trainings. They are classified into Basic *Kaizen* Trainers (hereinafter referred to as Basic Trainers) and Advanced *Kaizen* Trainers (hereinafter referred to as Advanced Trainers) based on the course they have completed.

Qualified *Kaizen* consultants are *Kaizen* Trainers who have passed the proposed certification system. They are further classified into *Kaizen* Consultant, Senior *Kaizen* Consultant, and Principal *Kaizen* Consultant according to their ability as depicted in the following Fig. 3.1-1.

In addition to this, there are *Kaizen* Leaders¹ who lead *Kaizen* activities within the organizations they belong to.



Source: JICA Study Team

Figure 3.1-1 Structure of *Kaizen* Trainers and *Kaizen* Consultants

¹ “*Kaizen* Leader” does not indicate a leader for QC circles established within an organization, but someone who leads *Kaizen* activities within the organization.

Methods of training *Kaizen* Trainers and *Kaizen* Consultants, and requirements for certification are described in the following part. Table 3.1-1 summarizes definitions and roles of *Kaizen* Trainers and *Kaizen* Leaders.

Table 3.1-1 Definitions and Roles of *Kaizen* Trainers and *Kaizen* Leaders

	<i>Kaizen</i> Trainer	<i>Kaizen</i> Leader (within an organization)
Definition	A person who is not an employee of an enterprise, and gives guidance on <i>Kaizen</i> activities from outside of the enterprise. There are two types of <i>Kaizen</i> Trainers: Basic <i>Kaizen</i> Trainers and Advanced <i>Kaizen</i> Trainers. A Basic <i>Kaizen</i> Trainer gives guidance on basic <i>Kaizen</i> , such as 5S, <i>Muda-dori</i> , etc., mainly for SMEs. An Advanced <i>Kaizen</i> Trainer gives guidance on both basic and advanced <i>Kaizen</i> for enterprises of all sizes, and also trains junior <i>Kaizen</i> Trainers (both Basic Trainers and Advanced Trainers).	A staff member of an enterprise or a public agency who implements <i>Kaizen</i> activities in the organization. A <i>Kaizen</i> leader is trained directly by experts or <i>Kaizen</i> Trainers and plays a leading role in <i>Kaizen</i> activities.
Selection criteria	Selection criteria are: (1) Committed to improve quality and productivity (<i>Kaizen</i>) at a given workplace. (2) Have a bachelor's degree or equivalent. (3) (Preferred) Have more than three years of work experience.	Top management of an enterprise/public agency selects a person who meets the criteria described below. (1) A foreman or group leader with hands-on knowledge and experience who is able to demonstrate a leadership for guiding employees at a workplace. (2) (If any QCC activities are already in practice) The <i>Kaizen</i> leader may be selected from circle leaders.
Activities	Identify problems in enterprises, propose relevant <i>Kaizen</i> activities, and instruct on the implementation or applying <i>Kaizen</i> techniques learnt from experts or Advanced <i>Kaizen</i> Trainers.	Play a leading role to carry out <i>Kaizen</i> activities proposed by experts or <i>Kaizen</i> Trainers. Organize QCCs for <i>Kaizen</i> activities.
Training methods	(1) Class-Room Training (CRT) (2) In-Company Training (ICT) at pilot enterprises (3) Overseas training for <i>Kaizen</i> Trainers (optional)	(1) CRT on basic <i>Kaizen</i> skills and awareness on problem identification (2) In-Company Training (ICT) (3) Presentation at <i>Kaizen</i> conferences
Evaluation and Recognition	Experts or Advanced <i>Kaizen</i> Trainers evaluate candidate <i>Kaizen</i> Trainers based on the results of their written examinations, skill maps, ICT performances, etc.	Experts or <i>Kaizen</i> Trainers evaluate <i>Kaizen</i> leaders based on attendance at CRT, process and results of <i>Kaizen</i> activities, performance of presentations at a <i>Kaizen</i> conference, etc.

Note: Experts refer to foreign (including Japanese) experts. The same shall apply hereinafter.

Source: JICA Study Team

3.1.2 Requirements for *Kaizen* Trainers

Qualifications required for *Kaizen* Trainers are listed below and are roughly divided into basic capability and specific capability.

Table 3.1-2 Basic and Specific Capability Required for *Kaizen* Trainers

I Basic capability	
1. Committed to improve quality and productivity at a given workplace	Inquiring mind, Ability to get things done for quality and productivity improvement
2. Have a bachelor's degree or equivalent and more than three years of work experience	Social common sense, Understanding, Mathematical ability, Language skills
3. Communication skills	Presentation ability, Negotiation, Sociability, Cooperativeness, Sympathy
4. Management capability	Ability to provide a direction for problem solving, Work management, Ability to cultivate human resources
II Specific capability	
1. Understanding of the concept and methods of <i>Kaizen</i> , and leadership	Knowledge and the ability to provide guidance in the fields of quality/productivity and business management
2. Knowledge and skills in a specialized field	Knowledge and experience in a specialized field, Appropriate technology, etc.
3. Experience of guidance at workplaces, report writing skills	More than 1,000 hrs. of experience of guidance at workplaces

Source: JICA Study Team

The specific capabilities are broadly divided into those related to the field of quality/productivity and those related to the field of business management. Considering the industrial structure and the level of corporate development in Africa, the scope and levels to cover in each field are described below.

(1) Skills in quality and productivity improvement

Kaizen Trainers are required to possess a wide range of knowledge and ability (hereinafter called “skills”) related to *Kaizen*. However, taking into account general situations of firms in Africa, not all *Kaizen* Trainers need to acquire a high-level of *Kaizen* skills. Basic *Kaizen* skills (such as 5S, Visual Control and *Muda-dori*) are sufficient, especially for *Kaizen* in micro and small-scaled companies at this moment. On the other hand, if we look ahead to the future, advanced *Kaizen* skills (such as Layout, SMED, SQC and even TPS, TPM, and TQM in some cases) are also needed for industrial development and enhancement of international competitiveness.

(2) Skills in business management

Managers of Micro, Small and Medium - size Enterprises (MSMEs) in African countries often lack basic knowledge of business management. Thus, *Kaizen* Trainers are often asked to provide advice on business management as well as on *Kaizen* at workplace (in both manufacturing and service industries). Furthermore, to assist them to exploit outcomes of *Kaizen* activities in their business for further growth and development, they need to provide guidance on issues in business management. Therefore, *Kaizen* Trainers should acquire skills related to quality and productivity improvement and business management.

Taking into consideration the above argument, skills necessary for a *Kaizen* Trainer can be organized into four modules as shown in Fig. 3.1-2.

<div>Module II</div> <ul style="list-style-type: none"> ● 7QC Tools (Advanced) ● New 7QC Tools ● SMED ● Time Study ● Work Sampling ● Line Balance ● Lay out ● TQM ● SQC ● Cost Management ● TPM ● TPS 	<div>Module IV</div> <ul style="list-style-type: none"> ● Accounting ● HRM & Organizational Behavior ● Marketing ● Strategic Planning ● Business Development
<div>Module I</div> <ul style="list-style-type: none"> ● Productivity & Quality ● Introduction of <i>Kaizen</i> ● 5S ● Visual Control ● <i>Muda-dori</i> ● QCC ● 7QC Tools (Basic) ● Standardization ● <i>Kaizen</i> Consulting ● Production Planning ● Inventory Control ● Method Study 	<div>Module III</div> <ul style="list-style-type: none"> ● Basic of Management ● Critical Thinking
Quality and productivity fields	Business management fields

Source: JICA Study Team

Figure 3.1-2 Skills for *Kaizen*

The content of each module is shown below.

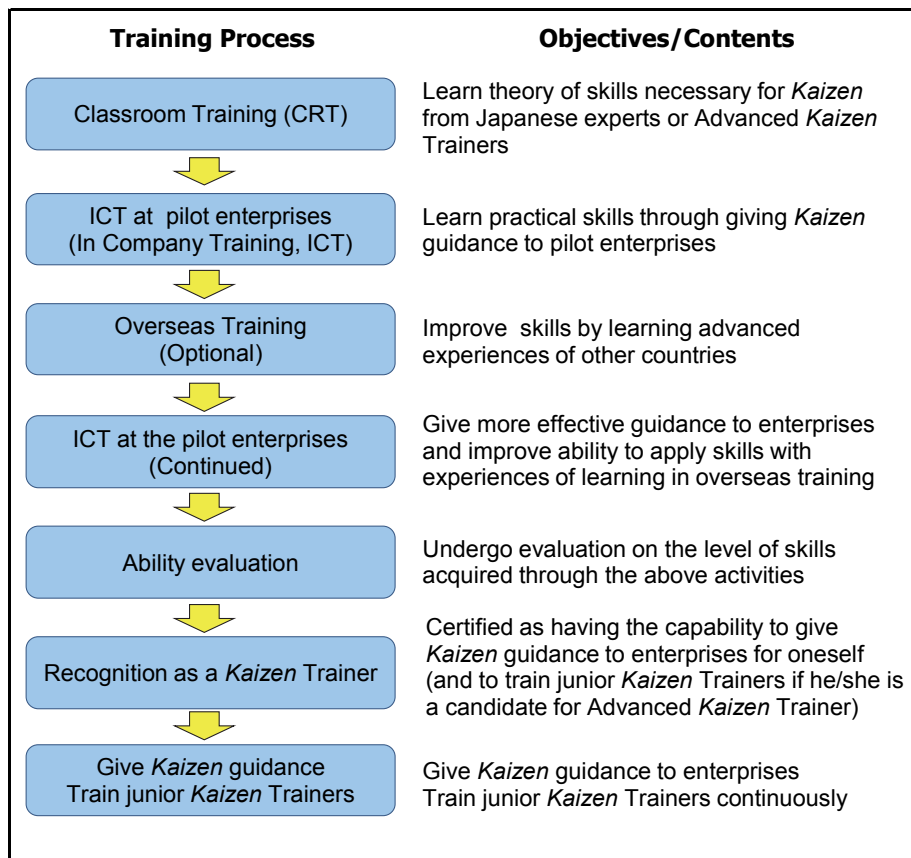
- Module I: Elementary skills such as 5S, Visual Control, and *Muda-dori* which need to be applied regardless of company sizes.
- Module II: Skills necessary for advanced *Kaizen* for providing guidance for large companies or future development of industry. Total management systems for production activities.
- Module III: Basic knowledge in corporate management and skills in identifying and solving problems.
- Module IV: Management skills for management excellence of a company as a whole, which are necessary as organizations become more structured and the level of organizational management goes up.

The order for completing each module shown in Fig. 3.1-2 is to begin with Module I. To help SMEs to apply the *Kaizen* skills learned in Module I in a way that allows them to survive and grow, the knowledge and skills on business management listed in Module III are also necessary. Therefore, the fields (necessary skills) that *Kaizen* Trainers should study first are Module I and Module III, which are thus positioned as basic *Kaizen*. After studying basic *Kaizen*, they learn more specialized methods for improvement in quality and productivity at workplace in Module II, which constitutes a part of advanced *Kaizen*. Acquiring deeper knowledge on business

management covered by Module IV, another element of advanced *Kaizen*, is also necessary for advising companies with better workplace organization, especially when helping them to improve their organization-wide performance.

3.2 Standard Program for *Kaizen*-related Human Resource Development

Kaizen Trainers are trained through Classroom Training (CRT) and In-Company Training (ICT). Optional Overseas Training is also effective. The basic training flow is shown in Fig. 3.2-1.



Source: JICA Study Team

Figure 3.2-1 Flow of *Kaizen* Trainer Training

- (1) As shown in Table 3.1-1, *Kaizen* Trainers are classified into Basic Trainers and Advanced Trainers. They are trained through different programs, and those who have completed the training for Basic Trainers are eligible to receive training for Advanced Trainers.
- (2) Under the Training of Trainers (ToT) approach, experts train Advanced Trainers in the first stage, and Advanced Trainers trained in the first stage train candidates of Basic Trainer and junior Advanced Trainers. In the latter case, Advanced Trainers are expected to improve their own capacity and skills through training the candidates.

3.3 Course Organization for Classroom Training (CRT)

The following two tables detail key subjects of the four modules presented in Fig. 3.1-2. Table 3.3-1 presents skills required for Basic Trainers and Table 3.3-2 for Advanced Trainers.

Table 3.3-1 Skills for Basic Trainers

Classification	No	Title	Contents	Category	Time
Module I (Basic Kaizen)	1	Productivity and Quality	Concept of productivity, How to measure productivity, Measures to improve productivity, Roles of productivity, Productivity movement of Japan, What is quality, View of QC concept, Quality of service, QC, How to promote QC, Quality improvement in Japan	A+	6
	2	Introduction of Kaizen	Basic concept of Kaizen, Basic concept of QC, Steps for Kaizen, 5S implementation, Idea creation technique, Problem solving techniques, QCC, Suggestion scheme, Muda-dori, Measures to eliminate Seven Wastes, Kaizen management	A+	6
	3	5S	Accumulation of unnecessary items, Concept of 5S, Benefits of 5S, Steps of 5S implementation (basic and detail), 5S and Kaizen, Evaluation of 5S, How to maintain 5S activity	A+	3
	4	Visual Control	Overview of visual control, Visual 5S control, Visual management for production gembu, Visual Management for Sales, R&D, and Marketing	A+	3
	5	Muda-dori	What is Muda-dori, Seven wastes, Measures to eliminate seven wastes, Reduction of Muda, Muri, Mura, ECRS (Eliminate, Combine, Rearrange, and Simplify) +3S	A+	3
	6	QCC	QCC fundamentals, Workplace and QCC activities, Implementing QCC activities, QCC meeting, Team leadership, Role of top management	A	3
	7	7QC Tools (Basic)	Checklist, Pareto diagram, Cause-effect diagram, Stratification	A	3
	8	Standardization	Objectives of standardization, Implementation of standardization, Remarks on standardization	A	3
	9	Kaizen Consulting	Management consulting, Who is a Kaizen consultant, How to proceed Kaizen consulting, QCC & Kaizen Leader, Themes selection, Problem solving techniques (QC story)	A	6
	10	Production Planning	What is production management, Types of production, Work-in-process, Production planning, Progress control, Part purchasing plan and control, Supplier management	B	6
	11	Inventory Control	Supply chain management, Inventory control in production plant, Function of warehouse, Warehouse control, Reduction of inventory in manufacturing process	B	3
	12	Method Study	Work management, IE, Work improvement, Method study, Process analysis, Motion analysis, Principles of motion economy, Learning curve	B	6
Module III (Basic Business Management)	13	Basics of Management	What is business management, Enterprise and stakeholder Scientific management, Enterprise diagnosis	A	3
	14	Critical Thinking	What is critical thinking, Inductive method and deductive method, Zero base thinking, Why method, Mutually exclusive and collectively exhaustive, Frame work thinking, Pyramid structure, Logic tree for cause pursue and problem solving	A	6
Total	60 hrs.				

Note: A+: The most basic skills used frequently A : Skills used frequently B : Skills used relatively infrequently

Source: JICA Study Team

Table 3.3-2 Skills for Advanced Trainers

Classification	No	Title	Contents	Category	Time
Module II (Advanced <i>Kaizen</i>)	1	7QC Tools (Advanced)	Histogram, Scatter diagram, Control chart, How to use 7QC tools in problem solving	A	3
	2	New 7QC Tools	Affinity diagram method, Relation diagram method, Tree diagram method, Matrix diagram method, Arrow diagram method, PDPC (Process decision program chart) method, Matrix data analysis method	A	6
	3	SMED	Concept of SMED (Reduction of setup time), Setup time, Process of setup, Problems in setup, Improvement of external setup, Improvement of internal setup, Example of mechanical improvement	A	3
	4	Time Study	Standard time, Direct time study, Rating, allowance, Working analysis	A	3
	5	Work Sampling	Features of work sampling, Classification of work, Procedures of work sampling, Analysis of result, Practice of work sampling	A	3
	6	Line Balance	What is line balance, Purpose of line balance, Method of line balance improvement, Effect of line balance improvement	A	3
	7	Layout	What is layout improvement, Method of layout improvement, Layout to reduce transportation cost, Effect of layout improvement	A	3
	8	TQM (Total Quality Management)	TQM concept, Daily management, Policy management, Cross functional management, Leadership, Advanced problem solving, Six sigma, Management quality (MBNQA, JQA, Deming criteria), New product/process development, IT utilization	A	6
	9	SQC	What is SQC, Basics of statistical data, Control chart for variables, Control chart for attributes, Process capability, Acceptance sampling, Statistical testing and estimation	B	6
	10	Cost Management	Basic understanding for (BS + P&L+ Cash Flow), Control accounting (<i>Kaizen</i> view points from accounting) Cost analysis & <i>Kaizen</i>	B	6
	11	TPM (Total Productive Maintenance)	Concept of TPM, TPM outline, TPM structure, 5S and TPM, Autonomous maintenance, Planned maintenance, Education and training, Overall equipment effectiveness (OEE), Quality maintenance, Steps for TPM implementation	B	6
	12	TPS (Toyota Production System)	Concept of TPS, Elimination of wastes, JIT (Continuous flow production, Production leveling, Standardized work, Multi-skill workers, SMED), <i>Kanban</i> system, Autonomation (<i>Jidoka</i>), <i>Poka-yoke</i> , Built-in quality, Application of JIT TPS lean principles	B	6
Module IV (Advanced Business Management)	13	Accounting	Corporate accounting, Balance sheet, P/L statement, Cash flow statement, Financial analysis, Break-even-analysis	A	6
	14	HRM & Organizational Behavior	What is HRM, Personnel management system, Performance appraisal system, Management by objective, Wage system, Career development, Need hierarchy theory, Motivation-hygiene theory, X-Y theory, Leadership	A	6
	15	Marketing	What is Marketing, Market research, Product concept, Target marketing, Marketing mix, Product lifecycle, Service marketing, Brand management	B	6
	16	Strategic Planning	What is Management Strategy, Vision/mission and Corporate strategy, Domain/core competence, Product/market matrix Experience curve	B	6
	17	Business Development	What is entrepreneurship, Innovation Organizational management, What is business plan, Structure of business plan, How to develop business plan/assessment	B	6
Total	84 hrs.				

Note A: Skills used frequently B: Skills used relatively infrequently
Source: JICA Study Team

Table 3.3-1 classifies skills most frequently used in basic *Kaizen* as category A+ skills, frequently used as A, and skills less frequently used as category B. This classification is based on experience in JICA's *Kaizen* projects in Africa (for example, a project in Zambia conducted between 2014 and 2016), and information obtained through a survey in five *Kaizen* implementing countries in Africa in 2017 (Kenya, Tunisia, Ghana, Ethiopia and Cameroon).

When it is a priority to train *Kaizen* Trainers who give the most basic *Kaizen* guidance to MSMEs with no *Kaizen* experience in a short time, training only on the skills marked with A+ may be considered as an alternative.

In Table 3.3-2, skills for advanced *Kaizen* are also divided into A and B categories based on the same idea. Standard lecture time of each subject is indicated in the rightmost column of the tables.

Skills listed in Table 3.3-1 and Table 3.3-2 are applicable not only for the manufacturing industry, but for the service industry and public sectors.

This method of course organization for the Classroom Training (CRT) merely shows a standard configuration; every country does not need to cover all of these items in their CRT. The degree of industrial development and needs of each country, as well as industrial policy, etc. should be taken into consideration. Each country is required to determine their course organization using these standard course configurations as a base.

3.4 Classroom Training (CRT)

Classroom Training (CRT) is lectures provided by experts or Advanced Trainers, prior to In-Company Training (ICT), for the purpose of educating required theoretical elements of skills to candidates of Basic Trainers and Advanced Trainers.

The first stage uses textbooks prepared by experts. For the second stage and thereafter, Advanced Trainers revise textbooks if necessary. They need to be revised in step with the progress of *Kaizen* dissemination.

3.4.1 CRT for Basic Trainers

CRT for Basic Trainers is summarized in Table 3.4-1. The standard program period is 2 weeks (10 days or 60 hours). Courses marked with an asterisk (*) correspond to those categorized as A+ in the right side of Table 3.3-1. They are the skills that should be acquired for providing guidance on more basic *Kaizen* in MSMEs. In this case, CRT can be conducted in 3.5 days (21 hours).

Table 3.4-1 Classroom Training for *Kaizen* Trainers

Day	Classification	a.m. (9:00-12:00)	p.m. (13:00-16:00)
1	Basic <i>Kaizen</i>	Productivity and Quality*	Productivity and Quality*
2	Basic <i>Kaizen</i>	<i>Kaizen</i> *	<i>Kaizen</i> *
3	Basic <i>Kaizen</i>	5S*	Visual Control*
4	Basic <i>Kaizen</i>	<i>Muda-dori</i> *	QCC
5	Basic <i>Kaizen</i>	7QC Tools (Basic)	Inventory Control
6	Basic <i>Kaizen</i>	Production Planning	Production Planning
7	Basic <i>Kaizen</i>	Method Study	Method Study
8	Basic <i>Kaizen</i>	Standardization	<i>Kaizen</i> Consulting
9	Basic BM**	<i>Kaizen</i> Consulting	Basic of Management
10	Basic BM**	Critical Thinking	Critical Thinking
Total		10 days (60 hrs.)	

**Business Management

Source: JICA Study Team

3.4.2 CRT for Advanced Trainers

CRT conducted for Advanced Trainers is summarized in Table 3.4-2. The standard program period is 3 weeks (15 days or 90 hours including Wrap-up session). This CRT is designed for Advanced Trainers who completed the training for Basic Trainers and thus does not include subjects covered by the CRT for Basic Trainers.

Table 3.4-2 Classroom Training for Advanced Trainers

Day	Classification	a.m. (9:00-12:00)	p.m. (13:00-16:00)
1	Advanced <i>Kaizen</i>	SQC	SQC
2	Advanced <i>Kaizen</i>	7QC Tools (Advanced)	New 7QC Tools
3	Advanced <i>Kaizen</i>	New 7QC Tools	SMED
4	Advanced <i>Kaizen</i>	Time Study	Work Sampling
5	Advanced <i>Kaizen</i>	Line Balance	Layout
6	Advanced <i>Kaizen</i>	Cost Management	Cost Management
7	Advanced <i>Kaizen</i>	TQM	TQM
8	Advanced <i>Kaizen</i>	TPM	TPM
9	Advanced <i>Kaizen</i>	TPS	TPS
10	Advanced BM*	Accounting	Accounting
11	Advanced BM*	Marketing	Marketing
12	Advanced BM*	Human Resources Management	Human Resources Management
13	Advanced BM*	Strategic Planning	Strategic Planning
14	Advanced BM*	Business Development	Business Development
15	Wrap up	Group Discussion	Group Presentation
Total		15 days (90 hrs.)	

*Business Management

Source: JICA Study Team

3.5 In-Company Training (ICT)

In-Company Training (ICT) is conducted under the guidance of experts or Advanced Trainers in the form of on-site *Kaizen* guidance for enterprises, thereby to enable them to acquire the ability to apply skills learned in the CRT.



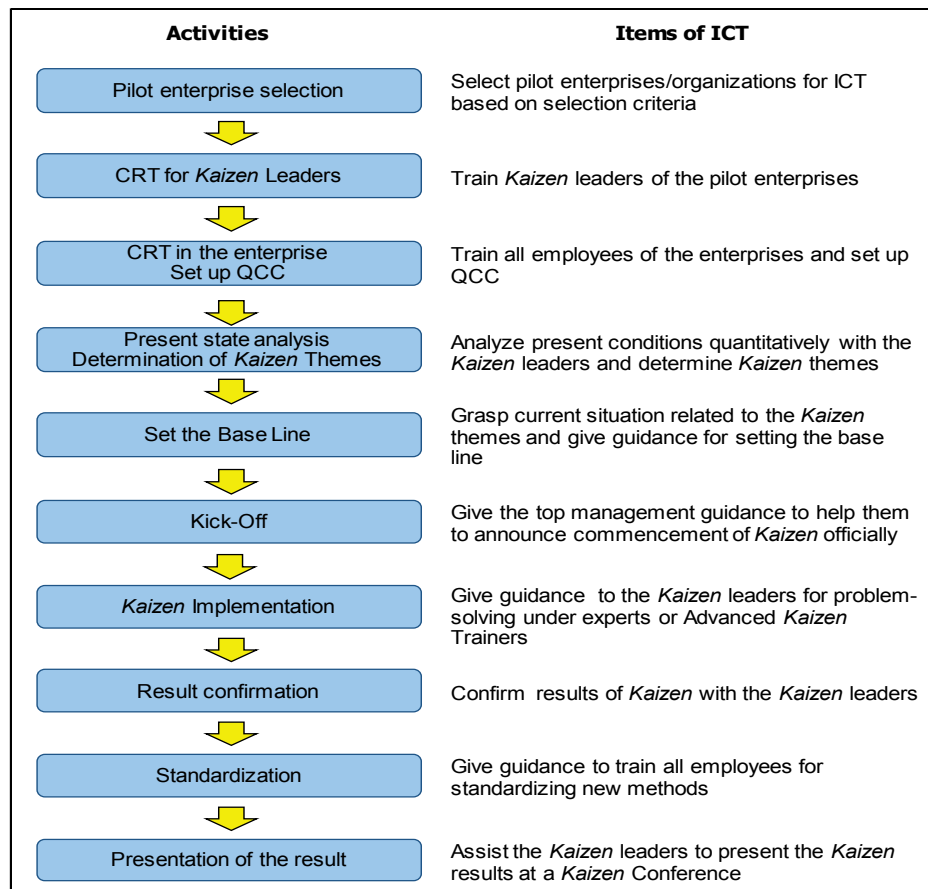
On-site guidance by an expert



On-site guidance by an Advanced Trainer

3.5.1 ICT in the form of *Kaizen* activity at pilot companies

Fig. 3.5-1 shows a general flow of the ICT conducted in the form of *Kaizen* guidance at pilot enterprises.

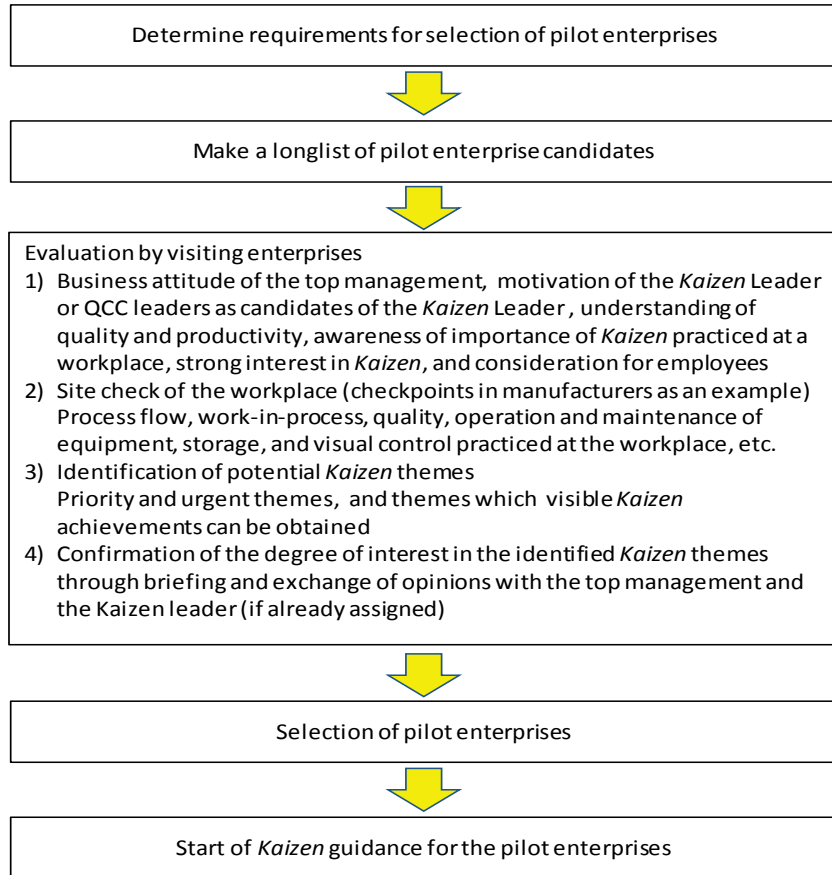


Source: JICA Study Team

Figure 3.5-1 Flow of the ICT

3.5.2 Selection of pilot companies participating in the ICT

Fig. 3.5-2 shows a general flow of selection of pilot companies.



Source: JICA Study Team

Figure 3.5-2 Flow of Selection Process of Pilot Enterprise

Table 3.5-1 shows an example of a pilot company evaluation sheet. Using such a sheet helps in selecting them in an objective manner.

Table 3.5-1 Pilot Company Evaluation Sheet (Example)

Item for selection			Contents of evaluation	Evaluation	Marks
Top management	1	Problem consciousness	Policy and numerical goals	5: The targets/issues of the enterprise are clear 3: The targets/issues are recognized to some extent 1: There is no awareness about targets/issues	
	2	Eagerness for <i>Kaizen</i>	Interest in <i>Kaizen</i>	5: There is effort to consider <i>Kaizen</i> as part of the company's activities 3: There is interest in <i>Kaizen</i> 1: There is no interest	
	3	Leadership	No. of visits to the workshop/office and No. of directions for improvement activities to employees	5: Leads subordinates by example 3: Displays leadership depending on situations 1: Leaves everything on the subordinates	
<i>Kaizen</i> theme and level of challenge	4	<i>Expected themes of Kaizen</i>	One theme is 5S. The other themes need to be agreed upon during interview.	5: Already have ideas of <i>Kaizen</i> themes 3: Have a rough idea about <i>Kaizen</i> theme 1: Have no idea	
	5	Implementation and Result	Degree of implementability and feasibility	5: The themes is highly implementable and feasible 3: The themes is implementable and feasible to some extent 1: Implementability of the themes is low	
<i>Kaizen</i> leader	6	Experience as a leader	Examples of outputs as a leader. What is his/her strength and weakness?	5: There are leaders who have sufficient leadership skills 3: There are personnel who have some leadership skills 1: There are no personnel with leadership skills	
	7	Eagerness to <i>Kaizen</i>	What kind of processes or items does he/she want to improve?	5: There are leaders with a strong eagerness to <i>Kaizen</i> 3: There are leaders with some eagerness to <i>Kaizen</i> 1: There are no leaders with eagerness to <i>Kaizen</i>	
	8	Operating skills for electrical devices	Ability to use e-mails, MS-PowerPoint, MS-Excel, Google search, and digital cameras	5: Have sufficient experience 3: Have some experience 1: Have no experience	
<i>Kaizen</i> team	9	Facilities for discussion/meetings	Availability of meeting room, white board, projector, camera, Internet, and employee noticeboard	5: There are sufficient facilities 3: There are meeting rooms 1: There are no facilities	
	10	Availability of the team	Number of teams and team members, How many hours per week can (do) they spend for <i>Kaizen</i> activities?	5: Necessary amount of time is spent on <i>Kaizen</i> jobs 3: Some amount of time is spent on <i>Kaizen</i> jobs 1: No time is spent on <i>Kaizen</i> jobs	
Total marks					
Selection: Yes/No					

Evaluation: 5 Excellent, 4 Good, 3 Normal, 2 Rather poor, 1 Poor

Source: JICA Study Team

Key evaluation viewpoints are:

- High commitment by the management (willingness to conduct *Kaizen* to improve quality/productivity)
- Willingness to assign in-company personnel suitable as a *Kaizen* leader
- Stability of management and business (steadiness enough to implement *Kaizen* and check and verify effects)
- Willingness to provide necessary management data and to disclose *Kaizen* results at a national *Kaizen* conference and other occasions
- Willingness/capacity to accommodate an ICT team, including provision of a meeting room
- Permission for photographing and video recording required for consulting activity
- Motivation of managers and employees and their willingness to engage and participate in *Kaizen* activity on a continuous basis
- Whether *Kaizen* Trainers can learn diverse *Kaizen* themes with good learning effects (to ensure that a variety of *Kaizen* themes are equally distributed among pilot companies)

- (When targeting all sectors) Whether to include companies/organizations in the service and public sectors as well as those in the manufacturing sector

Another key point in selection of pilot companies and organizations is proper selection of *Kaizen* leaders. Choosing good field leaders is critical to make *Kaizen* activity widely adopted as day-to-day practice i.e., good decision making and leadership of *Kaizen* leaders who are fully committed to quality/productivity improvement and *Kaizen* activity are essential to boost the morale of employees.














3.5.3 ICT for Basic Trainers

Since there are multiple candidates for training in most cases, it is necessary to divide them into teams to conduct the ICT on a per-team basis. Taking into account effectiveness of training and ease of conducting activities, the number of members per team should be 2-4 people (3-5 people per team when including an expert or a senior Advanced Trainer). An overview of the ICT implementation schedule for each team is shown below.

As the technical guidance for a pilot company takes at least for half a day per session, it is then realistic for an ICT team to visit one pilot company per day. In consideration of the fact that a certain time may be necessary for each pilot company to carry out activities proposed by the ICT team, visits of once every two weeks is appropriate. The target number of pilot companies per team is set at six (thus, three companies will be visited in each week). It is necessary to make a visit 8-10 times in order to produce a visible *Kaizen* effect and thus a standard ICT period should be 18 weeks (2 weeks x 9 times). In total, a standard training period for Basic Trainers is 24 weeks (6 months), consisting of 2 weeks for CRT, 3 weeks for selection of pilot companies, 1 week for CRT for *Kaizen* leaders, and 18 weeks for ICT.

In *Kaizen* activities, both outcomes and the implementation process is important, and it is necessary to measure activity results in numerical terms such as the number of QCCs, reduction of defect percentages, and productivity improvement rates, etc.

Fig. 3.5-3 shows a standard schedule for Basic Trainer training including CRT.

Month		1		2		3		4		5		6		
No. of Enterprise visit					1	2	3	4	5	6	7	8	9	
CRT (Module I & III)*														
Enterprise selection*														
CRT for the Top Management														
CRT for the <i>Kaizen</i> Leader														
ICT	In-Company CRT, Set up QCC*													
	Current situation analysis													
	Decision of <i>Kaizen</i> theme													
	Base line setup													
	Kick-Off*													
	<i>Kaizen</i> Implementation*													
	Result confirmation*													
	Standardization*													
	Presentation of result													

Source: JICA Study Team

Figure 3.5-3 Standard Schedule of Basic Trainer Training

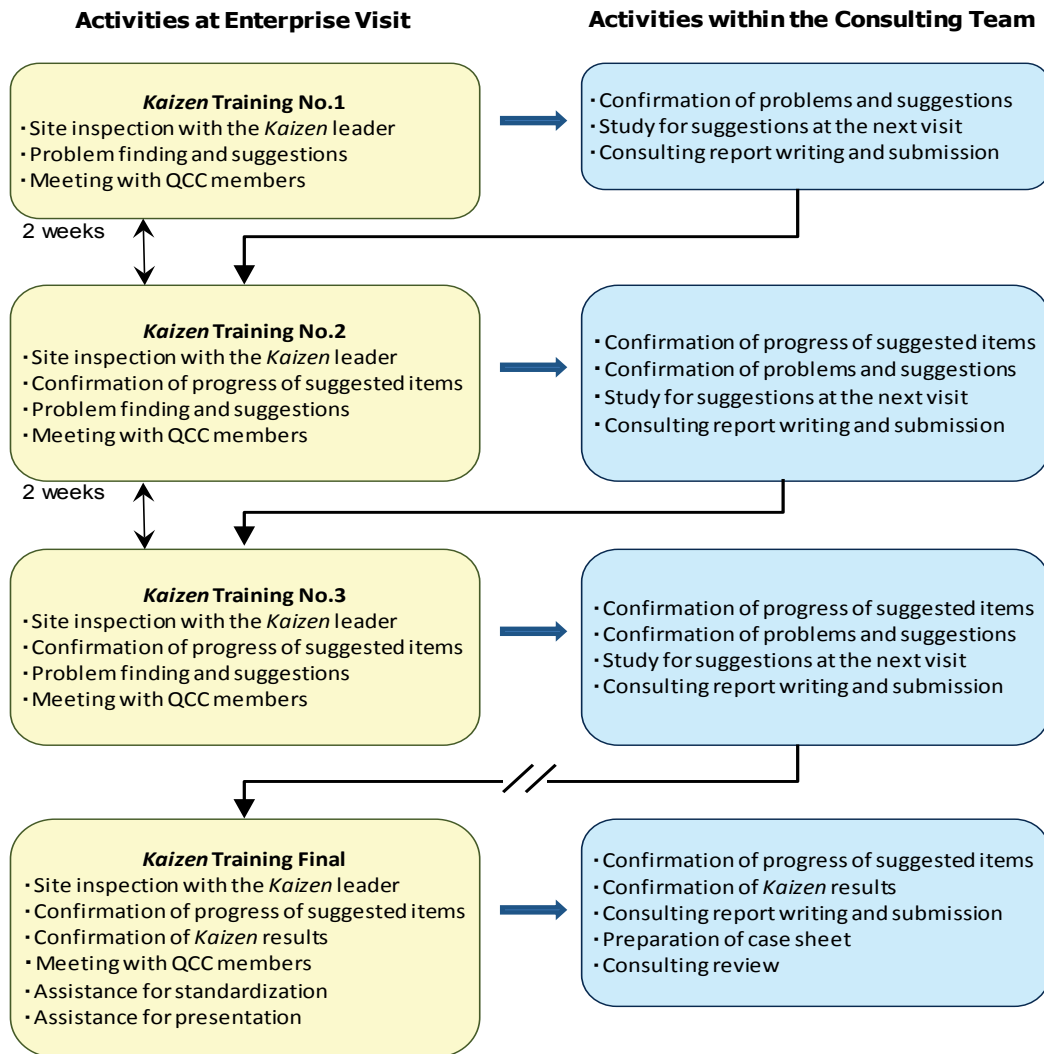
“CRT for Top Management” and “CRT for *Kaizen* Leaders” listed in Fig. 3.5-3 are training programs for top managers and *Kaizen* Leaders of the pilot companies. Details on this are given in Section 3.8 – Training of Intra-Firm Human Resources for *Kaizen*. In-company CRT in the table refers to training by an expert or an Advanced Trainer which targets all employees including the top management. It covers basic knowledge required to carry out *Kaizen*, such as objectives, implementation steps and confirmation of results.

Items marked with (*) in Fig. 3.5-3 shows activities to implement when guiding MSMEs the most important basic *Kaizen* as ICT in a shorter time. In this case, a standard training period including CRT will be about three months:

- 1st week: CRT of the skills marked with A+ in 3.5 days (21 hrs)
- 2nd to 3rd week: Preparation for ICT (company selection, in-company CRT, set-up of QCC)
- 4th to 12nd week: Implementation of ICT on the most important basic *Kaizen* (visits to companies about 4 times).

Under “*Kaizen* implementation” in Fig. 3.5-3, Basic Trainers carry out activities shown in Fig. 3.5-4 under the guidance of experts or Advanced Trainers.

Basic Trainers are expected to continue with the activities even in the absence of experts or Advanced Trainers. In such cases, experts or Advanced Trainers should provide necessary instructions in advance and guide them through web-based communication tools.



Source: JICA Study Team

Figure 3.5-4 Activities of Basic Trainers in the Implementation of *Kaizen*

Basic Trainers should compile a consulting report on their guidance like problems and recommendations after each visit which is submitted to each company. Finally, upon the completion of the consulting service, they should prepare a case sheet on each company.

【Box 3】 Key points of ICT

- ① One should not forget that the objective of *Kaizen* activity in pilot companies is to provide ICT for *Kaizen* Trainers as well as to verify *Kaizen* effectiveness. Care should be taken not to give priority to achieving results and neglect capacity building of *Kaizen* Trainers.
- ② Guidance and advice for *Kaizen* Trainers should not be provided in front of members of pilot companies so as not to cause doubts about capacity of *Kaizen* Trainers.
- ③ When a team of *Kaizen* Trainers visit a pilot company, a team leader should be appointed to serve as a contact person for the pilot company. The leader is also responsible for the preparation of consulting reports and case sheets.
- ④ Each consulting report should include all advice provided in a chronological and cumulative order to make clear the process of consulting service.
- ⑤ Consulting reports should be sent to respective pilot companies with sufficient time before the subsequent visit.

3.5.4 ICT for Advanced Trainers

ICT for Advanced Trainers is basically conducted in 6 pilot companies with the same procedures as that for Basic Trainers, except that it takes longer time for CRT, selection of pilot companies, and ICT. It takes longer time for them because the training incorporates subjects and themes with higher technical levels, which makes it difficult to find suitable pilot companies. At the same time, longer hours are required to obtain expected effects from *Kaizen* activities. A standard training period for Advanced Trainers is approximately one year, consisting of 3 weeks for CRT, 4 weeks for selection of pilot companies, 1 week for CRT for top managers and *Kaizen* Leaders, and 40 weeks for ICT. The time necessary for training of Basic Trainers and Advanced Trainers is also based on the experience and information obtained from *Kaizen* implementing countries in Africa.

Fig. 3.5-5 shows a standard training schedule for Advanced Trainers including CRT.

Month		1	2	3		4		5		6		7		8		9		10		11		12	
No. of enterprise visit				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CRT (Module II & IV)		<div></div>																					
Enterprise selection		<div></div>																					
CRT for the Top Management			<div></div>																				
CRT for the <i>Kaizen</i> Leader			<div></div>																				
ICT	In-Company CRT Setup QCC			<div></div>																			
	Current situation analysis				<div></div>																		
	Decision of <i>Kaizen</i> theme					<div></div>																	
	Base line setup						<div></div>																
	Kick-Off							<div></div>															
	<i>Kaizen</i> Implementation								<div></div>														
	Result confirmation																	<div></div>					
	Standardization																			<div></div>			
	Presentation of the result																						<div></div>

Source: JICA Study Team

Figure 3.5-5 Standard Schedule for Advanced Trainer Training

3.6 Management of the *Kaizen*-related Human Resource Development Program

This section describes actions and activities to be undertaken in the planning stage and the implementation stage to ensure smooth training for Basic Trainers and Advanced Trainers.

3.6.1 Planning stage

(1) Formulation of human resource development plan

The objective of training *Kaizen* Trainers (Basic Trainers and Advanced Trainers), the number of Basic Trainers and Advanced Trainers to be trained, and training schedules need to be determined.

(2) Securing of experts or Advanced Trainers who serve as instructors

As described earlier, only experts or Advanced Trainers who completed training under experts can train candidates of Basic Trainers and junior Advanced Trainers. In practice, however, no such persons are available within the country when conducting training for *Kaizen* Trainers for the first time, in which case securing external experts is necessary. Possible candidates are experts in third countries (including Japanese experts), or experts in the country

concerned who were trained and recognized as having ability equivalent to those of third-country experts.

(3) Securing of trainees (candidates for Basic Trainers and Advanced Trainers)

Trainees (candidates for *Kaizen* Trainers) may be staff members of *Kaizen* promotion organizations, those belonging to related ministries and agencies, and individuals participating from the private sector (including private consultants). If there are staff members from relevant ministries and agencies who want to undergo training, or if there are not enough staff members in the promotion organizations to fill the required number of candidates, these ministries and agencies need to dispatch their staff.

In such a case, those from related ministries and agencies are usually expected to go back to their original positions after the training to conduct *Kaizen*-related activity, and thus an agreement should be made with regard to the secondment to a *Kaizen* implementation organization as needed.

Regarding those from the private sector, a future career should be clarified as to whether they may be hired by the *Kaizen* promotion organizations as Basic Trainers and/or Advanced Trainers.

(4) Determination of training fees

Prior to the recruitment of trainees, training fees need to be determined. This is an important factor for participants from the private sector, whereas it is not a big problem for those belonging to *Kaizen* implementation organizations or related government ministries and agencies.

(5) Decision on the treatment of trainees

It is important to decide, prior to the recruitment, on the treatment of trainees during the training period such as availability of allowance, payment standards for food, accommodation and daily allowance for a visit to a company in a remote location.

(6) Preparation of equipment and materials for CRT

Teaching materials for CRT are normally prepared in presentation software like Microsoft PowerPoint and thus a PC and a projector are necessary for CRT in addition to a whiteboard and a marker.

(7) Securing of work space

It is critical to secure meeting rooms for CRT and ICT-related meetings, together with work space for preparation of consulting reports and other documents, preferably with a desk and a chair for each trainee.

(8) Selection of pilot companies for ICT

How to allocate pilot companies for ICT between sectors, between regions, and between seizes need to be decided.

(9) Securing of transportation

It is a must to secure vehicles for ICT teams for their visits to pilot companies, because they bring a PC, a projector, and other necessary items and many companies might be located in remote places. When two or more teams may conduct on-site guidance simultaneously, it is imperative to secure vehicles as many as the number of the teams.

3.6.2 CRT implementation stage

(1) Attendance check

Proper attendance constitutes a recognition requirement for Basic Trainer and Advanced Trainer.

(2) Monitoring

Monitoring should be made as to whether instructors (either experts or an Advanced Trainers) conducts lecture in an interactive way, and whether trainees have a lively discussion exchanging ideas and experiences with each other, etc.

(3) Evaluation

After the completion of CRT, a questionnaire survey should be conducted to hear opinions of trainees and reflect them in the subsequent CRT program as needed.

3.6.3 ICT implementation stage

(1) Participation of trainees

Proper attendance for ITC constitutes a recognition requirement for *Kaizen* Trainers.

(2) Confirmation on progress of *Kaizen* activities

(3) Evaluation on *Kaizen* guidance by pilot companies (hearing or questionnaire survey)

(4) Recognition of Basic Trainers and/or Advanced Trainers

Decisions need to be made as to whether to recognize each candidate as *Kaizen* Trainers and who to hand over the certificates of recognition.

3.7 Capacity Evaluation

In promoting capacity development of Basic Trainers and Advanced Trainers, it is important to perform fair and adequate evaluation on their capability, which helps raise motivation and incentives. Based on this principle, capacity evaluation should be conducted by means of a written examination and a skill map.

3.7.1 Capacity evaluation by written examination

As an objective way of evaluation, a written examination is conducted at the end of the CRT, both in the basic and the advanced ones, to see if *Kaizen* Trainer candidates have obtained knowledge and skills learned in the training.

3.7.2 Capacity evaluation by skill map

Kaizen skills and general ability required for consulting service are evaluated with skill maps according to the following five scales in the training for Basic Trainers (on Basic *Kaizen*) and Advanced Trainers (on Advanced *Kaizen*).

- | | |
|----------|---|
| Level 5: | Capable of performing consulting activity without guidance of experts (and providing training for would-be Basic Trainers and Advanced Trainers if he/she is a candidate Advanced Trainers) |
| Level 4: | Capable of performing consulting activity without guidance |
| Level 3: | Capable of performing consulting activity under occasional expert guidance |
| Level 2: | Having knowledge and skills required for consulting service but having no consulting experience |
| Level 1: | Having some but insufficient knowledge and skills required for consulting service |

Table 3.7-1 presents an example of a skill map for Basic Trainers. Evaluation with a skill map is made three times, namely at the beginning, in the middle, and at the end of the training period. In every stage, evaluation starts with self-evaluation by Basic Trainers, and then an expert's team serving as instructors interview them for final evaluation. In some cases, they may receive lower evaluation in some items at a later stage.

Skill maps are useful not only as an evaluation tool but also as a communication tool between experts/Advanced Trainers and Basic Trainers. Capacity evaluation for the Advanced Trainers follows the same procedure.

Table 3.7-1 Skill Map for Basic Trainers (Example)

Name		Mr./Ms.														
No	Skills for <i>Kaizen</i>	Initial stage (Base Line)					Interim stage					Final stage (End Line)				
		Level					Level					Level				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	Productivity & quality	X							X						X	
2	<i>Kaizen</i>	X								X						X
3	QCC	X								X						X
4	5S		X							X						X
5	Visual control	X							X							X
6	<i>Muda-dori</i>	X							X						X	
7	7QC Tools (1)	X							X						X	
8	Production planning	X							X				X			
9	Inventory control	X						X						X		
10	Method study	X						X						X		
11	Standardization	X						X							X	
12	<i>Kaizen</i> consulting	X								X						X
13	Basic of management	X							X						X	
14	Critical thinking	X							X						X	
Average Level		15/14=1.1					40/14=2.9					57/14=4.1				

Note 1 Level 5 --- Able to render consulting service without advice from experts (and to develop Basic Trainers and junior Advanced Trainers) (5 points)

Level 4 --- Able to render consulting service without advice of experts (4 points)

Level 3 --- Able to give guidance with occasional advice from experts (3 points)

Level 2 --- Have necessary knowledge and skills, but no experience of consulting (2 points)

Level 1 --- Do not have enough knowledge and skills for consulting (1 point)

Note 2 Requirements for recognition as a *Kaizen* Trainer: (1) average score at 3.5 or above for selected skills, and (2) the entire individual scores at 2.0 or above at the final stage.

Source: JICA Study Team

3.7.3 Recognition of Basic Trainers and Advanced Trainers

After a series of training was completed, recognition should be made to confirm that a person is qualified as a *Kaizen* Trainer having experience and skills required to provide *Kaizen* guidance for companies.

Recognition conditions shown in Table 3.7-2 are intended for candidates of Basic Trainers and Advanced Trainers in the first round. In the second round and thereafter, the “expert” in the conditions should be read as “Advanced Trainer”. This means that the trainees in the second round receive training of the same contents and composition and evaluation for recognition from Advanced Trainers who were recognized after the completion of the first round training in place of experts. Likewise, trainees assigned to the third round training receive training and evaluation for recognition from Advanced Trainers trained in the second round. This cycle serves as a system to foster *Kaizen* Trainers in a continuous manner.

Table 3.7-2 Recognition Requirements for Basic Trainers and Advanced Trainers

CRT	Attendance ratio : 90% or more; Written examination : 65 marks or more
ICT	Number of pilot enterprises to give <i>Kaizen</i> guidance : 5 enterprises or more for both Basic Trainers and Advanced Trainers Number of visit to pilot enterprises: (1) Visits together with an expert: 80% or more; (2) Visits by Basic Trainers or Advanced Trainers alone: more than once /month for each enterprise Number of <i>Kaizen</i> guidance cases: Two or more per enterprise Report submission for each visit : 100% Case sheet submission: one or more case sheets /each enterprise
Skill Level	Evaluation by skill map :3.5 points or more on average; 2.0 point or more for all skills in selected skills
Training Period	Training Period : (1) Basic Trainers : 6 months (2) Advanced Trainers : 1 year (after certified as <i>Kaizen</i> Trainers) Attendance for regular meetings with an expert: 70% or more

Source: JICA Study Team

The recognition as an Advanced Trainer is a prerequisite to be certified as a *Kaizen* Consultant, based on the certification system proposed in the next section, and it is necessary to satisfy other specific requirements set in the certification system to become one.

3.7.4 *Kaizen* Consultant certification system

The purpose of *Kaizen* Trainer training is not only to build their capacity to implement *Kaizen* at companies in the country concerned to help them to improve their quality and productivity, but also to transfer knowledge and skills from Advanced Trainers to Basic Trainers that could contribute to scale-up of *Kaizen* dissemination from human resources development point of view. However, this alone does not guarantee the sustainability of *Kaizen* dissemination. To maintain sustainability, it is necessary to go one step further and implement a *Kaizen* consultant certification system. One major advantage of establishing a consultant certification system is that it allows *Kaizen* Trainers to stay motivated by showing them a clear career path. It can also be used as a benchmark by clients in selecting a *Kaizen* consultant they need.

This handbook proposes a certification system which is linked to the training program for *Kaizen* Trainers which are described in the previous sections. In the proposed system, only Advanced Trainers, who have completed both training programs for Basic Trainers (Module I and III) and Advanced Trainers (Module II and IV), are eligible to apply for certification as a *Kaizen* Consultant. Table 3.7-3 shows the titles and qualification requirements² of the certification system.

² This is a proposal as of preparation of this handbook and an actual certification system to be developed may be different: For example, a uniform certification system in Africa might be developed in the future.

Table 3.7-3 *Kaizen* consultants Titles and qualification requirements

Title	Requirements
Principal <i>Kaizen</i> Consultant	<ul style="list-style-type: none"> To complete Basic and Advanced <i>Kaizen</i> courses and have <i>Kaizen</i> consulting experience of over 5,000 hours. To pass the written and oral examinations.
Senior <i>Kaizen</i> Consultant	<ul style="list-style-type: none"> To complete Basic and Advanced <i>Kaizen</i> courses and have <i>Kaizen</i> consulting experience of over 3,000 hours. To pass the written and oral examinations.
<i>Kaizen</i> Consultant	<ul style="list-style-type: none"> To complete Basic and Advanced <i>Kaizen</i> courses and have <i>Kaizen</i> consulting experience of over 1,000 hours. To pass the written and oral examinations.

Source: JICA Study Team

Since both theoretical knowledge and practical experience are necessary to certify a person as a *Kaizen* Consultant, it is desirable to establish written and oral examinations and to set a minimum required period of consulting experience for certification. The necessary period of consulting experience required to become eligible for certification at each level is set as shown in Table 3.7-3.

It is also desirable to link the certification system to the training curriculum for *Kaizen* Trainers. Advanced Trainers spend nearly 1,500 hours for *Kaizen* guidance during the training, whereas Basic Trainers spend roughly 500 hours³. According to the field surveys made in Singapore and Malaysia—which are already working on disseminating *Kaizen* on their own—approximately one year experience, which is equivalent to around 1,000 hours, is necessary to become able to provide consulting service for SMEs with no assistance from others. Argentina, which has its own certification system even though its implementation suffers from certain problems, has also set 960 hours, which is almost similar to the period set by Singapore and Malaysia.

In consideration of the fact that these countries, which have achieved a certain level of industrial development, have set the required experience period at nearly 1,000 hours, it is necessary for African countries to set longer required period of experience, because many of them are still in the developing stage, which makes it difficult to gain as various consulting experience as can be gained in more developed countries. Therefore, the handbook proposes 1,000 hours of experience as an eligibility criterion for *Kaizen* Consultants and 3,000 hours for Senior *Kaizen* Consultants, given that certified Advanced Trainers obtain about 1,500 hours of consulting experience in the training.

³ These figures (500 hours and 1,500 hours) are based on the assumption that *Kaizen* Trainer candidates spend three to four days per week (3.5 days on average), eight hours per day with the operation rate at 70%. Training for Basic Trainers continues for half a year (about 25 weeks), and that for Advanced Trainers for 1.5 years (half a year for the training for Basic Trainers, which is a prerequisite, and one year for Advanced Trainers, a total of which is about 75 weeks). Then, Basic Trainers spend 490 hours (3.5 days*8 hours*70%*25 weeks) for training and consulting service, and Advanced Trainers 1,470 hours (3.5 days*8 hours*70%*75 weeks).

3.7.5 Establishing and managing a certification system

To develop standards for certification, it is desirable to determine in advance who conducts the certification examinations and how, as well as the interval and conditions to review for renewal, and expiration of the certification to ensure the quality and credibility of the consultants. For example, consultants have to renew their certification every four years in Argentina, and every three years in Singapore. If a given country has similar certifications, and then consistency with them should be considered. For example, waiver of a part of the examinations may be considered for candidates who possess qualifications related to quality and productivity management or those who have a master's degree in management studies and industrial engineering.

To construct and manage a *Kaizen* Consultant certification system properly, the following items should be considered.

- (1) Establishment of a certification board.
- (2) Development of a *Kaizen* Consultant certification system by the certification board
- (3) Management of the certification system

(1) Establishment of a certification board

It is important to establish a certification board who certifies *Kaizen* Consultants. If certification is intended for those in the private sector in addition to the staff members of *Kaizen* promotion organizations and those from related ministries and agencies, the certification system has to maintain high levels of fairness and objectivity for all parties including *Kaizen* promotion organizations. In this light, it is desirable to include representatives from ministries, universities and other outside organizations (such as the chamber of commerce and industry) as well as academicians as board members in addition to personnel in charge of the certification system at the *Kaizen* promotion organizations. In addition, the certification board should be operated mainly with the three positions described below with the steering committee members being at the top of the hierarchical structure.

1) Certification board steering committee members

Certification board steering committee members need to have a deep knowledge in *Kaizen* and can establish the certification system itself. They can also make any necessary revisions to the system after it is established, if situational changes arise.

2) Certification examination members

Certification examination members need to be able to prepare the written examination and appropriately evaluate test-takers' ability during the oral examination. They can also determine whether certifications should be renewed, based on monitoring of activities after certification is acquired.

They check the consulting activity reports prepared by applicants, and if necessary, conduct interviews with the companies listed in the reports for confirmation.

3) Certification board secretariat

The secretariat administers the certification examination and performs regular monitoring after granting certification.

(2) Development of a *Kaizen* Consultant certification system by the certification board

It is the certification board who is responsible for establishing a *Kaizen* Consultant certification system, in particular, details and conditions of the certification. It is recommendable to prepare a chart to present the scope and levels of difficulty with regard to knowledge and skills essential for *Kaizen* guidance as certification criteria.

(3) Management of the certification system

For autonomous and continuous operation of the certification system, incentives for holders of the certification should also be considered. One of the reasons why the number of candidates and qualifiers of the certification system operated in Argentina is low is that there are very few merits of obtaining the certification. It may be difficult to set the certification as the occupational license for giving *Kaizen* guidance. However, it could be possible and effective to establish policy measures such as introducing certified consultants to companies which look for consultants for *Kaizen* implementation on a preferential basis or providing subsidies for enterprises that use certified *Kaizen* consultants.

3.8 Training of Intra-Firm Human Resources for *Kaizen*

3.8.1 Training of the top management

(1) Role of the top management

For successful *Kaizen* activities, strong commitment and leadership of the top management is a key factor. If they just demand results from *Kaizen* implementation without participating in *Kaizen* activities, it does not raise employees' motivation or produce expected results. Therefore, it is necessary to have the top management of companies understand the following key points prior to implementation of *Kaizen*.

- 1) What *Kaizen* is about, including difference between *Kaizen* and innovation
- 2) Benefits of *Kaizen*
- 3) Methods to measure *Kaizen* results
- 4) Methods and procedures for implementation and monitoring of *Kaizen* activities

(2) Actions to be taken by the top management to show their commitment to *Kaizen*

1) Kick-off meeting

A kick-off meeting marks a formal declaration of the official start of *Kaizen* activities by the top management to all employees. It aims to demonstrate strong commitment of the top management to *Kaizen* and thereby to raise motivation of employees.

2) Support for *Kaizen* Leaders

- Appointment and announcement of a *Kaizen* Leader
- Permission to conduct *Kaizen* activities during working hours
- Other indirect support

3) On-site patrol

The top management visits shop floors to obtain information on work conditions and equipment operation.

4) Attendance at *Kaizen* meetings

Attendance at *Kaizen*-related meetings, even in a short time, can clearly show strong commitment of the top management to employees.

5) Diagnosis by the top management

The top management receives regular reports from the QCC team and evaluates the status of *Kaizen* activities. This diagnosis is a valuable opportunity to convey the voice of the top management directly to employees.

6) Awarding system

Giving incentives to a team or an individual who has produced an excellent result helps for sustainable implementation. Possible incentives include:

- Prize money
- Prize gifts
- Commemorative picture session and dinner with the top management
- Reflection on personnel assessment



Awarding system

7) Investment required for *Kaizen*

One of the major features of *Kaizen* is to use existing management resources effectively without making substantial investment, and yet minimal investment is usually required. For instance, stacks are necessary for storing items in a well-organized way, and paint for drawing boundary lines to separate work area, equipment installation area and passage.

To ensure that the top management fully understands the need for the above activities, it is desirable to conduct training for them before CRT training for *Kaizen* Leaders. It does not only helps them to have good understanding of *Kaizen* but also gives them an opportunity to exchange information and share problems with top managers in other companies. Table 3.8-1 shows an example outline (timetable) of the training.

Table 3.8-1 Training for the Top Management (Example)

Time	Contents	Time
09:00-09:30	Opening speech	0.5 hr
09:30-10:30	<i>Kaizen</i>	1.0 hr
10:30-12:00	Implementation of <i>Kaizen</i>	1.5 hrs.
13:00-14:00	Duty of the top management	1.0 hr.
14:00-15:30	Group discussion	1.5 hrs.
15:30-16:00	Closing speech	0.5 hrs.
Total		6.0 hrs.

Source: JICA Study Team

3.8.2 Training of *Kaizen* Leaders

(1) Role of *Kaizen* Leaders

Kaizen Leaders take a lead in *Kaizen* activities, including implementing recommendations made by Basic Trainers or Advanced Trainers. Their commitment and leadership are one of the keys to the success of *Kaizen* activities.

The Roles of a *Kaizen* Leader are summarized as follows.

- 1) To serve as a leader for *Kaizen* activities implemented under the guidance of *Kaizen* Trainers.
 - Startup of QCCs
 - Guidance as to selection of QCC leaders
 - Transfer of basic *Kaizen* knowledge to QCC members, like QC tools, problem solving techniques, etc.
 - Support for QCC teams whose activities are stalled or sluggish
- 2) To develop an annual activity plan, event plans, educational plans, etc. for QC activities together with budget proposals, prepare a logo, internal posters, and pamphlets, etc. for promoting *Kaizen* activities, obtain approval from the top management, and implement them.
- 3) To compile progress of *Kaizen* activities and to make periodical reports to the top management.
- 4) To make a presentation and assume leadership at a *Kaizen* conference.

(2) Training of *Kaizen* Leaders

Kaizen Leaders can build their capacity through the following activities and experience.

- 1) Learn basic knowledge in a CRT which is organized for *Kaizen* Leaders of pilot companies before starting an ICT.
- 2) Share awareness on problems facing them in group discussions conducted in the CRT.
- 3) Implement *Kaizen* activities and mentoring QCCs under the guidance of experts, Basic Trainers or Advanced Trainers.
- 4) Make a presentation at a *Kaizen* conference.

(3) CRT for *Kaizen* Leaders

Table 3.8-2 shows an example of a CRT for *Kaizen* Leaders.

Table 3.8-2 CRT for *Kaizen* Leaders (Example)

Day and Time		Contents	Time
Day 1st	08:30-09:00	Opening Speech	0.5 hrs
	09:00-12:00	<i>Kaizen</i>	3.0 hrs
	13:00-16:00	Duty of <i>Kaizen</i> Leader	3.0 hrs
Day 2nd	09:00-12:00	QCC/Team work	3.0 hrs
	13:00-16:00	5S, Visual Control	3.0 hrs
Day 3rd	09:00-12:00	<i>Muda-dori</i>	3.0 hrs
	13:00-16:00	7QC Tools	3.0 hrs
Day 4th	09:00-12:00	Problem solving techniques	3.0 hrs
	13:00-15:30	Group discussion	2.5 hrs
	15:30-16:00	Closing remarks	0.5hrs
Total			24.5hrs

*Time mentioned above includes two breaks, once each in the morning and in the afternoon.

Source: JICA Study Team

Under the guidance of experts or senior Advanced Trainers, candidate *Kaizen* Trainers prepare teaching materials covering the contents of the skills listed in Table 3.3-1 in a comprehensive way and serve as lecturers with an aim to acquire experience and improve capacity.

(4) ICT for *Kaizen* Leaders

Once every two weeks, an ICT team visits each pilot company to give on-site guidance. The visits include shop floor observation, meetings mainly with the *Kaizen* Leader and QCC leaders of respective companies to identify problems and make *Kaizen*-related proposals and recommendations. Based on these proposals and recommendations, *Kaizen* Leader directs QCCs to plan and conduct *Kaizen* activities on their own initiative.

As already described above, the success of *Kaizen* activities is largely depends on the commitment and leadership of *Kaizen* Leaders, together with strong commitment by the top management. To ensure successful results, it is important to select and train good leaders. In doing so, the support of the top management is indispensable.

(5) Recognition of *Kaizen* Leaders

It is *Kaizen* Leaders who are responsible for leading *Kaizen* activities after the completion of an ICT. A key factor to ensure sustainable *Kaizen* implementation is the extent to which companies can foster an in-house organization for *Kaizen* activities under the leadership of the *Kaizen* Leader. See Table 3.1-1 for conditions for recognition of *Kaizen* Leaders.

【Box 4】 Advantages of training and recognizing *Kaizen* Leaders

- ① Internal personnel with sufficient *Kaizen* skills and experience become available.
- ② Official recognition of *Kaizen* Leaders is expected to motivate them further to play a leadership role and thereby to promote sustainable *Kaizen* activities within companies.
- ③ Recognition as a *Kaizen* Leader constitutes a sort of status, providing various personal advantages such as allowing them to have pride in their work and being advantageous in terms of personnel evaluations.
- ④ Interchange between *Kaizen* Leaders in other companies allows them to learn with each other.
- ⑤ Training of *Kaizen* Leaders provides an opportunity for candidates for *Kaizen* Trainers to gain teaching experience.

3.9 Overseas Training

Although it is optional, sending Basic Trainers and Advanced Trainers to training in foreign countries on top of the CRT and ICT held in their home country is effective to develop further their knowledge and skills, including hands-on consulting skills. The following describes overseas training hosted or supported by JICA. (Note that training programs held in Japan or other countries on quality and productivity improvement are referred to as overseas training.)

3.9.1 Types of JICA's training programs

Table 3.9-1 shows main training courses hosted or supported by JICA, which are categorized into country-based training, subject-based training which is now named Knowledge Co-Creation Program, and third country training. The first two are held in Japan whereas the third one is held in countries other than Japan which are advanced in terms of *Kaizen* promotion. So far, Singapore and Malaysia have hosted third-country training. It is proven to be effective to send *Kaizen* Trainers and *Kaizen* consultants to these training in a planned way considering their current capacity level.

For application to these training courses, please contact your ministry or agency in charge of bilateral cooperation.

Table 3.9-1 JICA's Training Courses

Training Course	Country (Training Period)	Characteristics
Country-based Training	Japan (about 2weeks)	Taylor made training program developed upon request from developing countries. In some cases, Country-based Training is used as one component of JICA technical cooperation project. JICA <i>Kaizen</i> projects often use this scheme to send their counter parts to Japan for following purposes. <ul style="list-style-type: none"> ■ Learn Japanese policy regarding SME development and <i>Kaizen</i> dissemination ■ Visit Japanese enterprises/public agencies applying <i>Kaizen</i> practices and learn their corporate culture.
Subject-based Training (Knowledge Co-Creation Program)	Japan (4-7weeks)	Readymade training course designed by JICA. Allocation to each country is made upon hearing the request of developing countries through needs survey. Multiple countries participate to co-create knowledge within the participants. Currently, training courses regarding <i>Kaizen</i> are implemented in two levels <i>Kaizen</i> (introduction) and <i>Kaizen</i> (application).
Third Country Training	Countries other than Japan (1-3weeks)	Training course implemented by a third country with the support from JICA. The purpose of the training is to share, disseminate and establish their development experience, knowledge and technology. So far, Malaysia and Singapore is providing Third country training related to <i>Kaizen</i> for African countries.

Source: JICA Study Team

3.9.2 Key points in effective use of overseas training

It is clear from past examples that participation in overseas training contributes greatly to the improvement of skills and confidence as *Kaizen* Trainers. However, participation without a clear sense of purpose results in a limited effect.

Important points to be considered to ensure effective use of overseas training are:

- It is important to select a suitable course according to the intended career of participating *Kaizen* Trainers. Mismatches in technical levels or specialties may prevent trainees from understanding course contents.
- Selection of personnel should be made by taking into account a variety of factors, not only technical levels, but the willingness and motivation as *Kaizen* Trainers, together with good personality to ensure effective communication and good human relations with client companies.
- Overseas training should be used as a means to raise motivation within an overall career path for *Kaizen* Trainers.
- Participants should come to training with a firm problem solving attitude. They have to have a clear understanding on problems to be solved in relation to quality/productivity improvement, dissemination of *Kaizen*, and/or other issues to be addressed in their organizations or client companies before attending training.
- During the training, participants should strive hard to learn not only *Kaizen* knowledge and techniques but also culture and history, social institutions and organizational know-how of the country where training is held.
- Each participant must compile knowledge and experience obtained in the training course as source materials that can be used in practical work, which should be shared within their

organization after returning to the home country and can be used for consulting service for clients.

3.10 Measurement of *Kaizen* Effect and Performance Indices

3.10.1 Measurement method

Kaizen promotion organizations are interested in how much more value added a company generates by implementing *Kaizen*⁴, given that GDP is the total value added produced in a country within a certain period of time, and the economic growth rate is equivalent to a rate of increase in total value added. *Kaizen* improves business performance such as sales and profits in the long run. However, effects of *Kaizen* are not always reflected in improvement of business performance in the short run. Moreover, the value added a company generates is the result of its entire activity, part of which is *Kaizen*, and it is unreasonable to attribute all the increase in value added to *Kaizen*. It makes sense therefore to measure *Kaizen* effects by assessing them on an activity basis.

Some *Kaizen* effects cannot be measured quantitatively (qualitative effect)⁵. Moreover, among those that can be measured (quantitative effect), some can be indicated in monetary value (economic effect) while others cannot⁶. For this reason, *Kaizen* effects should be evaluated by measuring them quantitatively by using assessment indices while doing so in monetary terms as far as possible, and clearly identifying qualitative effects as well (See Table 3.10-1).

Table 3.10-1 Categories of *Kaizen* Effects

Qualitative effect :	Effect which can be observed but cannot measured in numerical terms
Quantitative effect:	Effect which can be measured in numerical terms
Economic effect:	Quantitative effect indicated in monetary terms
(Actualized) Economic effect:	Economic effect with actual impact on value added
Proforma Economic effect:	Economic effect only on a proforma basis (i.e. with no direct impact on value added), as opposed to actualized economic effect
Non-economic quantitative effect:	Quantitative effect indicated in non-monetary numerical terms

Source: JICA Study Team

⁴ Value added = net sales – outsourcing cost; when being in the black, gross profit (capital gain) + labor cost.

⁵ For instance, implementation of 5S facilitates discovery of abnormal conditions in the field. Identification of problems in production processes by reducing inventory is, among other things, a major effect that may eventually lead to an increase in the company's value added, but it cannot be measured quantitatively.

⁶ For instance, it is difficult to convert *Kaizen* effect relating to accident prevention into monetary value, because it is difficult to tell if an accident actually occurs, together with actual damage, until it actually happens.

(1) Target of evaluation

Indices used for evaluation consist of not only those used to measure actual effects (achievement indices) but also those to evaluate a change in employee's behavior and work environment, including safety (activity and environment indices). There are several reasons for this. First of all, *Kaizen* attaches importance to, in addition to actual effect, human resource development, awareness rising, and behavior change. Secondly, *Kaizen* often involves improvement of work safety. Thirdly, it often takes time until actual and quantitative effects, in particular economic ones, become observable, especially when there is a need to spend significant time for developing or improving work environments and/or management systems before starting problem solving. Qualitative effects, on the other hand, are usually obtained before realization of quantitative ones, and thus should not be underestimated.

(2) Evaluation indices

Evaluation indices consist of those that can be directly measured (raw data), such as number of cases, number of times, and length of time, and those calculated from multiple raw data (processed data) such as fraction defective. In individual enterprises, it is field workers (operators) who are responsible for measuring and recording raw data, which are used by supervisors and managers to calculate effects⁷.

In reality, however, *Kaizen* consulting service, especially on basic one, is often provided for companies that are unable to conduct proper production management (i.e. data measurement and recording) so that there are cases when “quantitative” effects cannot be measured due to the lack of proper information on the actual conditions before starting *Kaizen* activities⁸. To prevent such cases, it is imperative for *Kaizen* Trainers to collect key data and information at the time of corporate diagnosis and obtain missing information in the course of *Kaizen* guidance. If necessary, systems to measure and collect necessary data at individual companies should be developed and built up as part of *Kaizen* activities.

Activity and environment indices consist of those used to measure 5S score and *Kaizen* activity level, and those relating to work safety and morale (See Table 3.10-2).

⁷ Necessary raw data that are not monitored on a regular basis should be measured by operators and field supervisors before and after *Kaizen* implementation.

⁸ As advanced *Kaizen* sets specific *Kaizen* themes and is implemented according to activity steps including identification of current conditions and setting of specific goals, there is generally no major problem relating to confirmation of *Kaizen* effect. On the other hand, for implementation of basic *Kaizen*, where activity is conducted for all aspects that are feasible without limiting to specific equipment and phenomenon, quantitative evaluation of *Kaizen* effects requires the measurement of conditions in a broad range of the company's entire and individual operations.

Table 3.10-2 Activity and Environmental Indices

	Indicator	Unit	Formula	Remark
Work Environment	5S Score	Score		Use the 5S check sheet created in each country
Activeness	QCC Ratio	Number of People Engaged in QCC/Total Number of Workers		
	<i>Kaizen</i> Proposals Ratio	Cases (per Month or Year)/Number of People Engaged in QCC		
	Number of People Received External <i>Kaizen</i> Trainings	People/Period (Month or Year)		
Morale	Employee Turnover	%		
	Number of Absenteeism	Cases/Period (Month or Year)		
	Number of Unexcused Tardiness	Cases/Period (Month or Year)		
Safety	Period without Accidents	Days		
	Number of Accidents	Cases/Period (Month or Year)		The number of accidents accompanied by injury / disease /disability / death event
	Number of Accidents Accompanied by Lost Worktime	Cases/Period (Month or Year)		The number of accidents accompanied by lost worktime from the day after the accident due to the medical injury or illness treatment
	Number of Accidents NOT Accompanied by Lost Worktime	Cases/Period (Month or Year)		The number of accidents accompanied by medical treatment at a medical institution (including clinics in the office) due to injuries or illnesses during business but not resulting in any lost worktime on the next day of the accident and thereafter
	Number of Minor Accidents other than Those with/without Lost Worktime	Cases/Period (Month or Year)		
	Number of Near-accidents	Cases/Period (Month or Year)		The number of cases that could have led to a serious accident (it is necessary to seek active reports from workers and tackle them.)

Source: JICA Study Team

The following list depicted in Table 3.10-3 indicates key performance indices. Although they are classified according to productivity, quality, cost, and delivery, there are, in fact, many indices related to multiple categories, and they are basically classified for the sake of convenience. Since *Kaizen* themes and subjects vary with companies, which indices to use for evaluating *Kaizen* effects needs to be determined according to their specific *Kaizen* themes and outcomes to be obtained. Actual data before and after *Kaizen* implementation and the rate of change (absolute value of (“data before *Kaizen*” – “data after *Kaizen*”)/ (“data before *Kaizen*”)) represent *Kaizen* effect⁹.

⁹ For example, the *Kaizen* rate is 10 % when a detective rate has decreased from 10% to 9%: $| (10\% - 9\%) / 10\% |$. When production capacity has increased from 20 units to 30 units, the *Kaizen* rate is 50% : $| (20 \text{ units} - 30 \text{ units}) / 20 \text{ units} |$.

Table 3.10-3 Outcome Indices

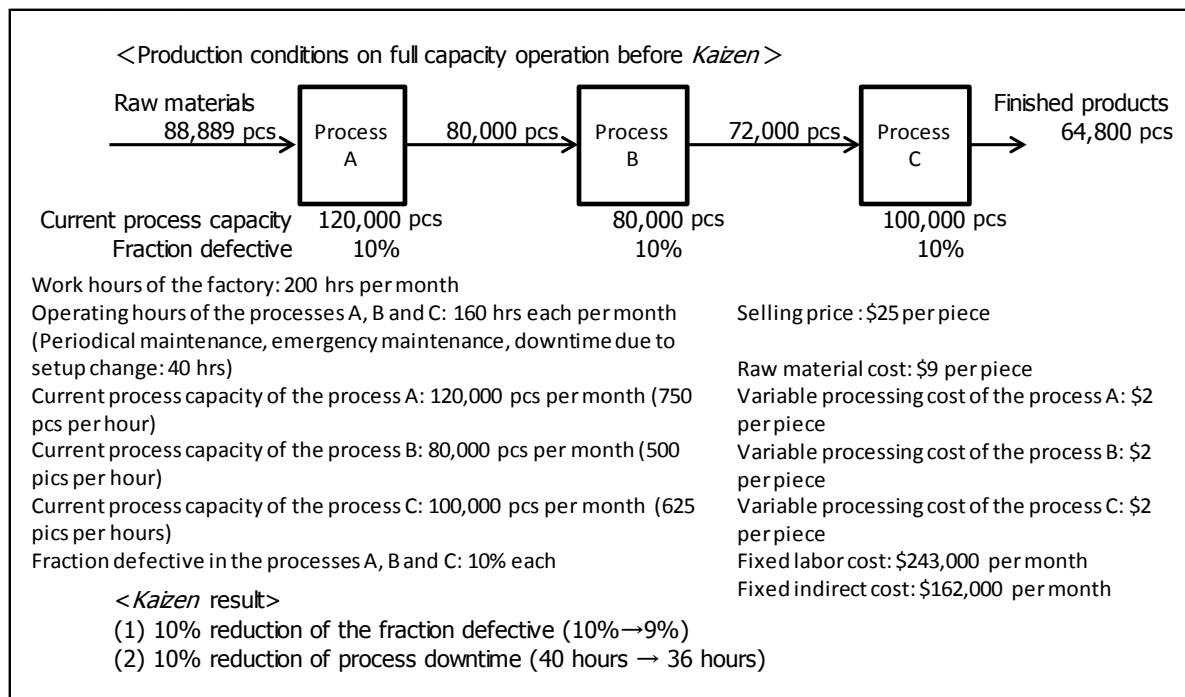
	Indicator	Unit	Formula	Remark
Productivity	Production (Processing) Capacity	Number, weight, etc. /Period (Month or Year)		
	Job Standard Time	Time (minutes)		
	Transport Distance	Time (minutes, hours), Distance(meters)	Weight of Raw Materials and/or Work-in-Process × Transport Distance	
	Labor Productivity	Number, weight, etc. /person, time	Value Added/Total Work Time	
	Utilization Rate corresponding to Shipping Quantity	%	Overall Equipment Effectiveness × Shipping Quantity / Production Quantity	Extent of equipment efficiency in terms of shipped quantity
	Overall Equipment Effectiveness	%	Availability Rate × Performance Rate × Quality Rate (or Non Defective Rate)	Operational efficiency of production equipment (Quality Rate: 1-Defective Rate)
	Availability Rate (Equipment)	%	Operation time / Load time = (Load Time - Failure Loss Time - Changeover Loss Time - Tool Change Loss Time - Start-up Loss Time) / (Work Hours - Planned Outage Hours)	Proportion of actual operating time of equipment relative to the scheduled operating time
	Downtime due to Breakdown	Time/Period (Month or Year)		
	Number of Breakdown (Failures)	Cases/Period (Month or Year)		
	Changeover Time	Time/Period (Month or Year)		Time to stop lines / equipment for set-up adjustment or/and lot changes
	Performance Rate (Equipment)	%	Net Operation Time / Operation Time = (Operation Time - Intermittent Short Stoppage Time and Idling Loss Time - Slower Speed Loss Time) / Operation Time = Planned Cycle Time × Production Volume / Operation time	Ratio of actual production speed (quantity) to equipment capacity (designed capacity described in specifications)
	Line Efficiency	%	Total Work Time of Each Process / (Cycle Time (or Work Time of Bottleneck Process) × Number of Processes) × 100	Ratio to show the efficiency of production line organization
Quality	Defective Rate	%	Quantity of Defective Units, both Dumped and Reworked/ Quantity of Units Produced (or Processed) × 100	
	Number of Dumped Units due to Defects	Cases/Period (Month or Year)		
	Go-through Rate		1-(Quantity of Dumped Units due to Defects + Quantity of Defective Units Used after Rework) / Quantity of Produced (Processed) Units	
	Number of Rework	Cases/Period (Month or Year)		
	Number of Complaints	Cases/Period (Month or Year)		Number of cases where products are returned, exchanged, or reworked at no cost, as products sold and delivered to customers are defective
Cost	Yield Rate	%	Amount of Production / Amount of Main Raw Materials Input × 100	
	Raw Materials Inventory	Days	Raw Materials Inventory / Use per Day	
	Work-in-Process Inventory	Days	Work-in-Process Inventory / Use per Day	
	Finished Goods Inventory	Days	Finished Goods Inventory / Sales per Day	
Delivery	On-Time Delivery Rate	%	Quantity Delivered within the Scheduled Date (Time) / Production Quantity × 100	
	Number of Delivery Delay Cases	Cases/Period (Month or Year)		
	Production Lead Time	Period (Minutes, Hours or Days)		Time taken from inputting materials at the factory until making them into finished products

Source: JICA Study Team

3.10.2 Calculation of economic effect

Quantitative effects should be measured in monetary value if possible¹⁰. There is an issue to note in doing so, namely economic effects are divided into those representing an actual increase in value added and those just representing estimation effects¹¹. It is true that a *Kaizen* activity which produces only estimation effects in the short term may lead to an increase in value added in the long term. Nevertheless, if an ultimate interest of *Kaizen* dissemination organizations lies on the value added *Kaizen* implementation generates, real economic effects should be separated from estimation effects. For this reason, the two need to be calculated separately.

The following presents examples showing how to calculate actual economic effect of two types of *Kaizen* activities conducted separately in an imaginary factory, assuming the other conditions constant, namely (1) 10% reduction of the fraction defective (10%→9%), and (2) 10% reduction of process downtime (40 hours→ 36 hours).



¹⁰ In considering which *Kaizen* themes to prioritize, it is desirable to make overall evaluation and judgement by taking into account the estimation of expected economic effects as well as quantitative ones and qualitative ones that cannot be converted to monetary value.

¹¹ For instance, suppose you conducted *seiri* (one of the 5S activities, which refer to distinguishing unnecessary items from necessary items and removing the former from workplaces) and that some space which used to be occupied has become vacant. It is possible to estimate a rent for the space and consider it to be the economic effect. However, if the paid rent does not actually decrease, the value added remains same, thus being only an estimation effect. See the examples of economic effect calculation in the following pages.

(1) Case when the factory is run at its full capacity because there is strong demand for their products and they sell as many as produced.

- 1) Economic effect in terms of profit and loss when the fraction defective in the process A is reduced by 10% (10% \rightarrow 9%): **\$10,747**

【Breakdown】

- Cost reduction by reduction of materials input and processed quantity at the process A by 977 pieces (88,889 pieces \rightarrow 87,912 pieces): 977 pieces \times \$9 + 977 pieces \times \$2 = \$10,747
(required materials input after *Kaizen* = 80,000 pieces/91% = 87,912 pieces)

- 2) Economic effect in terms of profit and loss when the fraction defective in the process B is reduced by 10% (10% \rightarrow 9%): **\$16,400**

【Breakdown】

- Sales increase due to an increase in production by 720 pieces (80,000 pieces \times 1% \times 90%): 720 pieces \times \$25 = \$18,000
- Cost increase due to increase in processing in the process C by 800 pieces (80,000 pieces \times 1%): 800 pieces \times \$2 = \$1,600

- 3) Economic effect in terms of profit and loss when downtime of the process A is reduced by 10% (40 hours \rightarrow 36 hours): **\$0**

- As the process B receives inputs as many as they can process even before *Kaizen*, an increase in processing in the process A due to longer operating hours does not increase production of final products (an increase in processing in the process A can only increase work-in-process completed before the process B.).

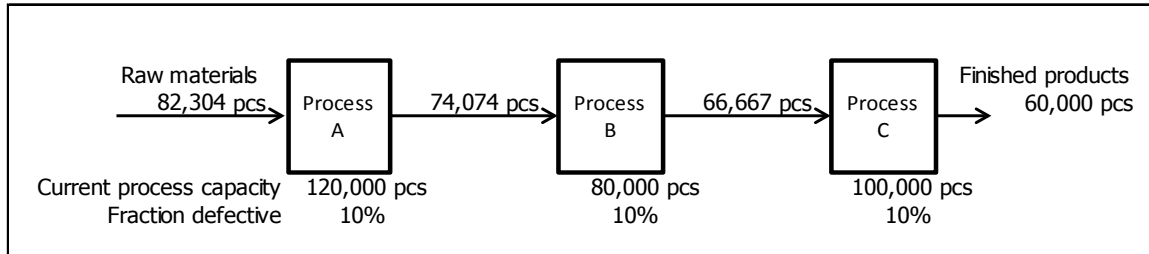
- 4) Economic effect in terms of profit and loss when downtime of the process B is reduced by 10% (40 hours \rightarrow 36 hours): **\$8,458**

【Breakdown】

- Sales increase due to an increase in production by 1,620 pieces: 1,620 pieces \times \$25 = \$40,500
Increase in quantity processed in the process B by 2,000 pieces (500 pieces \times 4 hours), of which 1,800 pieces are accepted (2,000 pieces \times 90%), while the 1,800 pieces are processed in the process C with 1,620 pieces being accepted as final products (1,800 pieces \times 90%).
- Cost increase due to an increase in input materials: 2,222 pieces \times \$9 = \$19,998
Input materials required to input additional 2,000 pieces in the process B: 2,222 pieces (2,000 pieces/90%).
- Cost increase due to an increase in processed quantity: 2,222 pieces \times \$2 + 2,000 pieces \times \$2 + 1,800 pieces \times \$2 = \$12,044
The number of pieces processed increases by 2,222 in the process A, 2,000 in the process B, and 1,800 in the process C (2,000 pieces \times 90%).

- (2) Case when the factory manufactures 60,000 units of products per month, lowering operation rates to avoid stockpiling unsold products.

The condition of the factory prior to *Kaizen* implementation which produces 60,000 units per month is summarized as follows:



- 1) Economic effect in terms of profit and loss when the fraction defective in the process A is reduced by 10% (10% → 9%): **\$9,944**

【Breakdown】

- Cost reduction by reduction of materials input and processed quantity at the process A by 904 pieces (82,304 pieces → 81,400 pieces): 904 pieces x \$9 + 904 pieces x \$2 = \$9,944 (required materials input after *Kaizen* = 74,074 pieces/91% = 81,400 pieces)

- 2) Economic effect in terms of profit and loss when the fraction defective in the process B is reduced by 10% (10% → 9%): **\$11,572**

【Breakdown】

- Cost reduction due to a decrease in quantity processed in the process B by 814 pieces (66,667 pieces/90% - 66,667 pieces/91%): 814 pieces x \$2 = \$1,628
- Cost reduction due to reduction of input materials and a decrease in quantity processed in the process A by 904 pieces (82,304 pieces → 81,400 pieces): 904 pieces x \$9 + 904 pieces x \$2 = \$9,944 (Materials input required to input 73,260 pieces in the process B (66,667/91%) = 73,260/90% = 81,400 pieces)

- 3) Economic effect in terms of profit and loss when downtime of the process A is reduced by 10% (40 hours → 36 hours): **\$0**

- As the process B processes the number of pieces required to produce 60,000 final products even before *Kaizen*, an increase in processing in the process A due to longer operating hours does not increase production of final products (an increase in processing by the process A can only increase work-in-process complied before the process B.).

4)

Economic effect in terms of profit and loss when downtime of the process B is reduced by 10% (40 hours → 36 hours): \$0

- As the process B processes the number of pieces required to produce 60,000 final products even before *Kaizen*, an increase in processing of the process B due to longer operating hours does not increase production of final products (an increase in processing by the process B can only increase work-in-process complied before the process C or final products.)

Note that *Kaizen* effect does not always come out only at the process where a *Kaizen* activity is implemented; it is often the case when it indirectly affects the other processes as well, as shown in the above case (1) 4) where *Kaizen* in the process B leads to (1) an increase in the number of raw materials input, (2) increases in the number of pieces processed in all the three processes A, B, and C, (3) changes in the number of accepted pieces in each process, and (4) the number of finished products. Also, the above case studies present the following:

- Two *Kaizen* activities conducted in different processes do not necessarily produce the same economic effect even if their themes and outcomes are same.
(For example, both the case (1) 1) and the case (1) 2) reduce the defective rate from 10% to 9%, but the effects are different: that of the former is \$10,747 and the latter \$16,400)
- Two *Kaizen* activities with the same *Kaizen* rate do not necessarily produce the same economic effect.
(All the cases presented above represent 10% of Kaizen (10% from 10% to 9%, or 10% from 40 hours to 36 hours), but the effects are different ranging from \$0 to \$16,400.)
- Two *Kaizen* activities which have the same content and are conducted at the same factory do not necessarily produce the same economic effect, depending upon the factory's operating status or condition.
(For example, the effect in the case (1) 1) and that in the case (2) 1) are different, although Kaizen in both cases are exactly same: the former is \$10,747 and the latter \$9,944.)

Appendix 1

Analysis of Country Studies

- Comparison of Human Resource Development in Each Country
- List of Training Program Subjects and Textbooks
- Organization Chart of *Kaizen* Promotional organizations in each country

Table 1 Comparison of Human Resource Development in Each Country

Items	Argentina	Cameroon	Ethiopia	Ghana	Kenya (KIBT)	Kenya (NPCC)	Malaysia	Singapore	Tanzania	Tunisia	Zambia
Form of employment during the training period	Staff members of C/P organizations (INTI)	Staff members of C/P organizations Staff members of other ministries and agencies Private consultants	Staff members of C/P organizations (staff members of Ethiopia KAIZEN Institute)	Staff members of C/P organizations (BAC heads)	· KIBT's employees only · A secondment program from other organizations will also be introduced in 2017.	NPCC staff members	MPC staff members	NPB staff members Employees of private companies	Staff members of C/P organizations and private consultants	Staff members of the C/P organizations (4 technology center)	Staff members of C/P organizations (KIZ)/participants from the private sector (at one's own expense)
Number of Kaizen Instructors (the number already certified)	Within INTI, 11 <i>Kaizen</i> Instructors (out of around 100) are certified as consultant. Notably, this is not certification as <i>Kaizen</i> consultant, but as a consultant having advanced knowledge and experience (similar to a consulting engineer in Japan) and there are only 30 certified consultants throughout the country.	First batch: 14 Second batch: 14 Third batch: 13	Ph1: 2009-11: 10 Ph2 (2011-14): 51 Ph3 (2015-20): 34 (planned to train 90 persons in total by 2020)	Ph1: 11 Ph2: 20 in Advanced <i>Kaizen</i> (Trainer BAC), and 10 in Basic <i>Kaizen</i>	9 Master Trainers (including 3 specialized in production management/quality control)	23 (including 20 who received training after the end of the project)	There is no concrete certification system. About 100 <i>Kaizen</i> offices.	About 200 person were trained.	· <i>Kaizen</i> Master Trainers: 13 · <i>Kaizen</i> Trainers: 6	Ph1: 19 persons (certificate of completion) First phase of Ph2: training of 23 Master Trainer candidates continued Second phase of Ph2: training of 30 Trainers continued (MT candidates provide field guidance under support of Japanese experts)	16 persons · <i>Kaizen</i> Trainers: 10 · <i>Kaizen</i> Consultants: 6
Training period for Kaizen Instructors	No specific standard	CRT: 2 weeks Collective ICT: 2 weeks Individual ICT: 3 weeks Presentation: 1 week	· Advanced <i>Kaizen</i> : 8 months · Basic <i>Kaizen</i> : 6 months (large and mid-sized enterprises) and 3 months (MSEs)	· Advanced <i>Kaizen</i> : 8 weeks · Basic KAIEN: 5 weeks	· Master Trainers: 3 years · Trainers: 1 year	No specific standard; generally one-week initial training and six-month ICT	Around one year	No information available on the JICA project At present: around one year	· <i>Kaizen</i> Master Trainers: 13 months (net) · <i>Kaizen</i> Trainers: 3.5 months (net)	· Master Trainers (MT): 4 years · Trainers (T): 2 years	· <i>Kaizen</i> Trainers: 2 years · <i>Kaizen</i> Consultants: 1 year
Instructors	JICA project (2009-10): Japanese experts Subsequently, senior <i>Kaizen</i> Instructors	· First batch: Japanese experts · Second batch: Consultants · Third batch: Consultants	· Advanced <i>Kaizen</i> : Japanese experts in the initial session, and persons who have completed the training program for the subsequent sessions (backup by Japanese experts) · Basic <i>Kaizen</i> : conducted by EKI consultants, with guidance for TVETs	· Advanced <i>Kaizen</i> : Japanese experts · Basic <i>Kaizen</i> : Trainer BAC (backup by Japanese experts)	· Initial year: Japanese experts · Subsequent years: Master Trainers	· During the project period: Japanese experts · After the project: For CRT, instructors in the training program in Japan and third country, and for ICT, senior consultants were implemented	Senior consultants within MPC	JICA project: Japanese experts and Key Productivity Activists (directly taught by Japanese experts)	· <i>Kaizen</i> Master Trainers: Japanese experts · <i>Kaizen</i> Trainers: Japanese experts/ <i>Kaizen</i> Master Trainers	· Initial year: Japanese experts · Subsequent years: MT candidates (under support of Japanese experts)	· <i>Kaizen</i> Trainers: Japanese experts · <i>Kaizen</i> Consultants: under guidance of KIZ <i>Kaizen</i> Trainers (backup by Japanese experts)
CRT (basic course)	No CRT program for new employees	2 weeks	1 month	1 week (5 days)	Total period: 21 days 1. Production/quality: 5 days 2. Marketing and sales: 8 days 3. Financial management: 5 days 4. Business and management skills: 3 days	Introduction (5 days), followed by guidance during the training program in Japan, PJ at MEI, and the training program in third countries At present, there is no regular education program within NPCC	There is no CRT program, while learning is expected from use of standard textbooks and manuals used for corporate guidance service, in addition to personal study in training programs of APO and JICA.	①Planning and coordination ②Promotion of dissemination ③HR and labor management training and dissemination ④Supervisor and manager training ⑤Safety and hygiene training ⑥Resource center	5 days (including two-day simulated corporate diagnosis at model company and presentation on the results)	15 days	12 days
CRT (advanced course)	No CRT program for new employees	No system for leveling	1 month	1 week (5 days)	No system for leveling	No system for leveling			20 days (including 3-week training in Japan)	10 days + 10 days for practice in a simulated production line	6 days
CRT textbooks	There is no textbook for new employee training (there is the one for the certification test)	Volume: 957 pages	Volume (basic): 433 pages Volume (advanced): 1065 pages	Volume (basic): 480 pages Volume (advanced): 382 pages	Volume: 687 pages (including 160 pages for production and quality fields)	Using teaching materials used in the training programs (no details confirmed)	Standard teaching materials designed for corporate guidance service are used. Example of a training course on the lean production system: Three textbooks (91, 127, and 70 pgs) + training manual (1,000 pgs)	Training manual: 3,974 pages Supplemental textbook: 2,890 pages Audiovisual materials: 1,123 minutes	Volume : 906 slides (106 for basic and 800 for advanced)	Volume (basic and advanced courses): 1,217 pages	Volume (basic): 1,307 pages Volume (advanced): 648 pages

Items	Argentina	Cameroon	Ethiopia	Ghana	Kenya (KIBT)	Kenya (NPCC)	Malaysia	Singapore	Tanzania	Tunisia	Zambia
ICT	Target sector for ICT There is no CRT program for newly employed consultants, and former training starts with ICT. ICT Instructors are required to be a MBA holder or IE engineer and are to be selected by the center's director. The ICT period is Not specified in a relevant standard, while experience of 1-2 years is considered as the prerequisite for full-fledged consultants. Reasons for not conducting the CRT program are that most of the contents are covered by courses in the IE department and practical education and training is conducted at universities.	Target sectors: Manufacturing and non-manufacturing industries	Target sectors: Manufacturing and non-manufacturing industries, and public sector	Target sector: Manufacturing industry	Target sector: Manufacturing industry	Target sector: Manufacturing industry	Target sectors: Manufacturing and non-manufacturing industries, and public sector	Target sectors: Diverse	Target sector: Manufacturing industry	Target sector: Manufacturing industry (machinery, electricity, chemical, textile)	Target sectors: Manufacturing and non-manufacturing industries, and public sector
		Collective ICT: 1 company/all <i>Kaizen</i> Instructors Individual ICT: 1 company/ <i>Kaizen</i> Instructor	During ICT under the guidance of Japanese experts 1 company/3 <i>Kaizen</i> instructor and after graduating from the project 1 company/1 <i>Kaizen</i> instructor.	2 companies per <i>Kaizen</i> Instructor (6-8 persons per team)	Number of companies served: 5 per year	There is no standard, but 3 companies per 6 months	2-3 companies per consultant (6 months) and 5-6 for one year	Number of companies served: Around 200 (mainly SMEs)	<i>Kaizen</i> Trainer (under support of Japanese expert): 2 companies/person (twice x 1 company) <i>Kaizen</i> Trainer (under support of <i>Kaizen</i> Master Trainer): 2 company/person	2 companies/ <i>Kaizen</i> Instructor, 18 in total	Number of companies served: More than 8 companies/ <i>Kaizen</i> Instructor
		Consulting period: Collective ICT - 2 weeks Individual ICT – 3 weeks (after collective ICT) Number of visits per company: Almost every day	Consulting period: Advanced <i>Kaizen</i> - 7 months Basic <i>Kaizen</i> – 5 months	Consulting period: Advanced <i>Kaizen</i> – 7 weeks Basic <i>Kaizen</i> – 4 weeks and follow up guidance	Consulting period: 1 year	Consulting period: Not set forth specifically, but around 6 months	Consulting period: 2 cycles are implemented in one year	Consulting period: JICA project – unknown At present, 6-9 months per company	Consulting period: First and second field practices - 6 weeks Third and fourth field practices – 6 months	Consulting period: 1 year	Consulting period: 7 months
			Number of visits per company: 3 times per week (once per week as standard)	Number of visits per company: Every day during initial period and 1-2 times per week	Number of visits per company: Twice per month	Number of visits per company: Not specifically set forth, but around once per week	Number of visits per company: Training for company staff during the first two months, followed by once per month as standard	Number of visits per company: Twice per month as standard	Number of visits per company: Twice per week I the initial period and once per week or every other week, depending on the actual condition	Number of visits per company: Once per 2 weeks	Number of visits per company: Once per 2 weeks
Training record other than CRT·ICT		Training in Japan: Once in 2016 (10 persons)	Training in Japan: 40 person (10 KU members & 30 company mangers) in 2010? Once in 2016 (8 persons)	Training in Japan: Once in 2015 (12 persons) and once in 2016 (10 persons)	Training in Japan: Once in 2016 (2 weeks, 10 persons)	No training in Japan	Training in Japan: No training in a foreign country	Training in Japan: JPC, JUSE, and Japanese companies	Training in Japan: April 2014 (17 persons)	Training in Japan: 21 persons in Ph1, and 16 in Ph2 (8 each in 2017 and 2018)	Training in Japan: Once in 2014 (8 persons) and once in 2016 (4 persons)
	15 persons	Subject-based training: Twice (2 persons), totaling 4 persons	Training in Japan: Twice (2 persons) Training at Mekelle University.	Subject-based training: Participation on a continuous basis	Training in Japan: 1 person	Subject-based training: 5 persons	Participation in the APO training and subject-based training programs on a continuous basis		Subject-based training: Participation on a continuous basis	Subject-based training: None in Ph2	Subject-based training: Twice (2 persons)
		Training in a third country: 4 persons in Ghana and 4 in Ethiopia	Training in a third country: 6 persons in total (1 in Malaysia and 5 in Argentine) and another 40 in Malaysia	Training in a third country: Participation on a continuous basis	Training in a third country: Not carried out	Training in a third country: 2 persons in Malaysia and 3 persons in South Africa	Training in a third country: Participation in the APO training program on a continuous basis		Training in a third country: N/A	Training in a third country: 9 persons in Singapore and Malaysia	Training in a third country: 2 persons in Malaysia
Skill map evaluation	N/A	Skill map evaluation: N/A	There is no skill map evaluation, while there is skill map evaluation during and after the ICT program, covering critical thinking capability in 7 items.	Implemented according to technical standards	Skill level at the end of training: Average of 3.04 for 3 trainers	No skill map evaluation formalized Desire to introduce a formal evaluation system	None (based on estimation)	None (based on estimation)	N/A	Implemented for MT (candidates) during the initial period, six month later, and one year later, followed by annual evaluation up to the fourth year	Skill map evaluation: 4.7 for the first year; 4.8 for the second year; and 4.3 for the third year
Capacity evaluation based on written examination (level and duration)	N/A	No written examination is conducted	Conducted before the start of the CRT program and at the end	Conducted at the end of the CRT program for each subject	Beginner's and intermediate levels, duration of test (1 hour)	No written examination is conducted	None (based on estimation)	There is a written examination for certification of PMC, on 2 modules selected out of 10.	No written examination is conducted	Conducted at the end of each year	Conducted at the end of training period (both basic and advanced) for 3 hours
Kaizen Instructor certification criteria	Those certified as competent <i>Kaizen</i> Consultant, must satisfy any of the following records; ①960 hours of consulting experience + written examination + oral examination ②Three-week CRT + 460 hours of	Training period: 2 months (JICA TOR)	Training period: • Advanced <i>Kaizen</i> – 8 months • Basic <i>Kaizen</i> – 5 months CRT attendance rate: 80% or higher	Training period: • Advanced <i>Kaizen</i> – 8 weeks • Basic <i>Kaizen</i> – 5 weeks N/A	Training period: • Master Trainers – 3 years • Trainers – 1 year CRT attendance rate: Not specified in a relevant standard	Training period: No formal standard (around six months at present) CRT attendance rate: Not specified in a relevant standard	Around 1 year None (based on estimation)	Training period: Unknown for the JICA project 6-7 months under the SPC program CRT attendance rate: None (based on estimation)	Training period: <i>Kaizen</i> Master Trainers – 13 months <i>Kaizen</i> Trainers – 3.5 months CRT attendance rate: full-day (100%)	Training period: • Master Trainers – 4 years • Trainers – 2 years CRT attendance rate: Not specified in a relevant standard	Training period: Trainers – 2 years (under guidance of Japanese experts) Consultant – 1 year CRT attendance rate: 90% or higher

Items	Argentina	Cameroon	Ethiopia	Ghana	Kenya (KIBT)	Kenya (NPCC)	Malaysia	Singapore	Tanzania	Tunisia	Zambia
	consulting experience + written examination + oral examination Overseas training ③Three-week CRT + practice under supervision of a senior consultant + 240 hours of consulting experience s + written examination + oral examination	Number of companies conducting ICT: 1 company for collective training 1 company for individual training	Number of companies conducting ICT: 1 company per consultant per year for advanced <i>Kaizen</i> & 2 companies/consultant/year for basic <i>Kaizen</i> (required to participate in the ICT program participated by other trainees) This only for under the project..	Number of companies conducting ICT: 2 companies per <i>Kaizen</i> Instructor (6-8 persons/team)	Number of companies conducting ICT: • Master Trainers: 8 or more • Trainers: 4 or more	Number of companies conducting ICT: Not specified in a relevant standard (at present around 3 companies)	Number of companies conducting ICT: 5-6 companies per year	Number of companies conducting ICT: Experience of at least 1,000 hours	Number of companies conducting ICT: During training of <i>Kaizen</i> Trainers – 2 companies per person (under guidance of Japanese expert), and 1 company per person (under guidance of <i>Kaizen</i> Master Trainer) During training of <i>Kaizen</i> Master Trainers – in addition to the above, 2 companies per person and one company each time by 1-2 persons	Number of companies conducting ICT: • MT : 1 or more per year (5 or more/4 years) • T : 1 or more per year	Number of companies conducting ICT: 8 or more during 6 months
Kaizen Instructor certification criteria		90% or higher for total of CRT and ICT	More than 90%	ICT attendance rate: Not specified in a relevant standard	ICT attendance rate: • Master Trainers – 90% or higher • Trainers – 90% or higher	ICT attendance rate: Not specified in a relevant standard	None (based on estimation)	ICT attendance rate: Not specified (based on estimation)	ICT attendance rate: Not specified for the guidance by Japanese experts, while under the guidance of <i>Kaizen</i> Master Trainers, <i>Kaizen</i> Trainer candidates conduct 13 or more in-company guidance activities each, which is accompanied by a <i>Kaizen</i> Master Trainer for 7 or more.	ICT attendance rate: 80% or higher	ICT attendance rate: 80% or higher
		Skill map evaluation performed	Skill map evaluation: N/A (evaluated on the basis of critical thinking capability, with 70% or higher as the passing level)	Skill map evaluation: Implemented according to technical standards • Basic – 5.5 or higher for 36 items • Advanced – 3.5 or higher for 75 items	Skill map evaluation: • Master Trainers: Average of 4.0 points or higher for all subjects, with capability to provide guidance service • Trainers: Average of 2.5 points or higher for all subjects, with capability to conduct lecture and consulting activity for oneself	Skill map evaluation: Not specified in a relevant standard	None (based on estimation)	No skill map evaluation performed	Skill map evaluation: N/A	Skill map evaluation: • MT : 4.0 or higher at the end of the program • T : (?)	Skill map evaluation: Average of 3.5 or higher for basic 10 subjects
		No written examination conducted	Written examination: 70 points or higher	Conducted but no passing mark established (70-80 points on average)	Written examination: 60 points or higher	Written examination: 80 points or higher for MT	None (based on estimation)	Written examination: —	Written examination: N/A	Written examination: MT: 80 points or higher	Written examination: 65 points or higher
		Submission of ICT report: 100%	Submission of ICT report: Periodical meetings held within EKI on ICT progress reporting	Submission of ICT report: 100%	Submission of ICT report: • Master Trainers – 100% • Trainers – 100%	Submission of ICT report: 100%	Submission of ICT report: Not known	Submission of ICT report: —	Submission of ICT report: Submission of action plan, presentation materials and final report required	Submission of ICT report: 100%	Submission of ICT report: 100%
		Preparation of case sheets: Not specified in a relevant standard	Preparation of case sheets: Not specified in a relevant standard	Preparation of case sheets: Not specified in a relevant standard	Preparation of case sheets: 2 cases or more per company	Preparation of case sheets: Not specified in a relevant standard	Preparation of case sheets: Not specified in a relevant standard (based on estimation)	Preparation of case sheets: None (based on estimation)	Preparation of case sheets: Not specified in a relevant standard	Preparation of case sheets: 2 cases or more per companies	Preparation of case sheets: 1 case or more per company
		None	None	None	Other factors (personality, potential, etc) – 4.0 or higher for Master Trainers and 3.0 or higher for Trainers	None	Other: None	Other: None	During the ICT program conducted by Japanese experts, evaluation is made on the following items: (1) <i>Kaizen</i> Trainers – level of understanding, capability relating to questioning, analytical skill, and actual activity; and (2) <i>Kaizen</i> Master Trainers - level of	None	None

Items	Argentina	Cameroon	Ethiopia	Ghana	Kenya (KIBT)	Kenya (NPCC)	Malaysia	Singapore	Tanzania	Tunisia	Zambia
									understanding, presentation skill, information gathering capability, leadership, and planning and implementation capabilities. During the ICT program conducted by <i>Kaizen</i> Master Trainers, evaluation is made on three items, with confirmation and approval by TKU.		
Title and Career path	INTI-certified Consultant	N/A	Title of <i>Kaizen</i> Consultant only, with the certification system to be started in October 2017	A certificate of completion on "Basic Course" or "Advanced Course" is issue upon the end of the program.	<ul style="list-style-type: none"> • Master Trainers: After three years of education and training • Trainers: After one year of education and training 	Title of <i>Kaizen</i> Consultant only	Certification of Productivity Champion for Productivity Consultants having certain levels of knowledge and experience	RMC: Registered Mgt Consultant PMC: Practicing Mgt Consultant SCM: Singapore Certified Mgt Consultant	<i>Kaizen</i> Master Trainers and Trainers	Titles of <i>Kaizen</i> Master Trainer and <i>Kaizen</i> Trainer	<i>Kaizen</i> Trainers and Consultants
Career path after training	INTI staff	<i>Kaizen</i> Instructor in the public or private sector	To continue <i>Kaizen</i> guidance service as EKI employee	To provide BDS for companies as part of the C/P organization	To work at an existing C/P organization/section	Currently working at the C/P organization, with a future plan to accept trainees from outside organizations	Continuing to work as MPC staff to provide <i>Kaizen</i> guidance service. After retirement, to work as private consultant	JICA project, NPB consultant, private consultant At present, mainly working as an outside consultant	<i>Kaizen</i> Trainer of a public organization and as private consultant	To conduct consulting activity within the C/P organization	Consultants belonging to the C/P organization, a government agency, or the public sector
Training at pilot companies	There is no formal mechanism for training of <i>Kaizen</i> Leaders, while special training is conducted for each team.	While education and training targeting <i>Kaizen</i> Leaders of pilot companies is not conducted, <i>Kaizen</i> Leaders are allowed to participate in a collective education program for <i>Kaizen</i> Instructors, totaling four to five days including the presentation of results.	While there is no formal mechanism to train <i>Kaizen</i> Leaders within pilot companies, persons in charge of <i>Kaizen</i> promotion are selected to receive training customized to each pilot company. It constitutes a few-day program covering <i>Kaizen</i> overview, 5S, muda-dori, and KPT (QCC).	<ul style="list-style-type: none"> • QA managers, factory managers and equivalent of pilot companies are designated as first contact and are to receive one-day lecture covering 5S, muda-tori, work safety and QC. 	<ul style="list-style-type: none"> • As there is no training program for <i>Kaizen</i> leaders working within a company, there is some risk relating to sustainability after the end of the project. • There is no activity to establish QCC, including follow-up guidance, to support bottom-up activity within the company. 	<ul style="list-style-type: none"> • There is no training program for <i>Kaizen</i> leaders working within a company, and there is some risk relating to sustainability after the end of the project. • Support for QCC activity is conducted. 	Prior to the start of consulting service, intensive training of three days and two nights was conducted for the top management of client companies (10-15 all together) for the purpose of raising their awareness. Also, in-company training is conducted for managers and leaders for two months after the start of the consulting activity.	JICA project: Training Productivity Activists at more than 200 companies, mainly SMEs. At present, there is no formal mechanism for training of <i>Kaizen</i> Leaders.	During the training program led by Japanese experts, a two-day CRT program is conducted for two representatives of each company prior to the start of the ICT program, then after the start of the ICT program, an introductory meeting is held for all employees. During the training program led by <i>Kaizen</i> Master Trainers, there is no CRT program held for company representatives.	<ul style="list-style-type: none"> • While individual training (around half day) for responsible persons selected by each company is conducted, covering 5S and other subjects, no collective education for <i>Kaizen</i> leaders is conducted (the same condition in the four C/P organizations). 	There is a certification system for <i>Kaizen</i> Leaders, consisting of collective education, ICT, and presentation at the <i>Kaizen</i> conference.
Other	Since 2012, the country has been accepting more than 100 trainees as part of the third-country training program from 15 Latin American countries and 3 African countries.	To conduct an overall presentation meeting after the end of ICT program		Trainer BAC: 11 persons who have completed Ph1 and 8 persons as selected from those who have completed the Advanced <i>Kaizen</i> CRT program, a total of 19 persons receiving the ToT program.					At the end of the ICT program, a seminar or a meeting is held at each company to present results.		

Source: JICA Study Team

Table 2 List of Training Program Subjects and Textbooks

Tunisia		Tanzania		Zambia		Kenya			
Basic Course									
I. TPS	slids	1. 5S	85	Basic Course	Vol	Production & Quality Improvement	Vol		
1. Outline of <i>Kaizen</i> based on TPS	40	2. 5S <i>Kaizen</i>	34	1. Productivity & Quality	154	KPQ 1 : Production management System & 5S	35		
2. 5S	40	3. General <i>Kaizen</i>	107	2. Basic Production Management	114	KPQ 2 : Work Site improvement by Muda Elimination & IE Method	38		
3. Visual Control	60	4. Guideline for TOT of <i>Kaizen</i>	40	3. <i>Kaizen</i>	116	KPQ 3 : Production Planning & Control/Manufacturing Cost Accounting	34		
4. JIT	40	Training in Japan		4. 5S	80	KPQ 4 : Quality Improvement & TQM	35		
5. JIDOKA	38			5. Visual Control	40	KPQ 5 : How to Organize Business Training & Consultation on PQM	18		
6. Genba <i>Kaizen</i>	40			6. Muda-dori	52	Management Strategy & marketing/Sales	63		
7. Consultation of QPI	14			7. QCC	126				
II. Basic TPM				8. 7QC Tools	158			1. Management Strategy	175
1. TPM Outline	12			3. TQM Overview	60	9. Inventory Control	74	2. Marketing Management	
2. TPM Implementation	21			4. Productivity Improvement for Tanzania	37	10. <i>Kaizen</i> Consulting	92	Business Skills & Management Skills	32
3. Overall Equipment Efficiency	19			5. 7QC Tools	73	11. Layout	59		
4. Focused Improvement	23			6. Workplace Mgt & Standardization	21	12. Method Study	128		
5. Planned Maintenance	38			7. Developing QCC Activities	43	13. Work Measurement	60	Part 2: Management Skill	
6. Initial Management	5	8. SQC	23	14. Work Sampling	54	Financial Management Training Program	54		
7. Autonomous Maintenance	20	9. QC Story	17	-Advanced Course-				1. Financial Management	19
8. Education And Training	9	10. Equipment Maintenance & PM	36					2. Management Accounting	21
9. Quality Maintenance	8	11. Layout & Material Handling	32					3. Cost Accounting	13
10. Safety & Environment	3	12. Management Diagnosis	62					4. Business Management	24
III. Basic TQM		13. QC & QA	24			18. Lean Production	106		
1. Quality Control	24	14. Basic of TPS	38	19. TPM	44				
2. TQM	219	15. <i>Kaizen</i> (Improvement)	21	20. TQM	137				
Advanced Course		16. Policy Mgt. & Daily Mgt.	25	21. QMS & ISO	138				
1. Outline of <i>Kaizen</i> Based on TPS	42	17. Formulation of Consulting Plan	22	22. Problem Solving Technique	64				
2. 5S	40	18. For Outgrowth of Current Practices-A Proposition	8						
3. Visual Control	60								
4. Just-in Time Production	40								
5. Jidouka	34								
6. QA in TPS	44								
7. Poka-yoke	20								
8. Kanaban System	48								
9. Outline of Dan-dori	28								
10. Maintense in TPS	60								
11. Stop Control	128								
Basic : 673 slides		Training in Tanzania : 266 pages		Basic : 1,307 slides		Production & Quality Improvement : 160 sliders			
Advanced : 544 slides		Training in Japan : 601 slides		Advanced : 648 slides		Total : 687slides			
Total : 1,217 slides		Total : 266 pages + 601 slides		Total : 1,955Slides					

Ethiopia		Ghana		Cameroon		Argentina	
Basic Course	slides	Basic Course	slides		Slides		Vol
1. <i>Kaizen</i> Overview	73	1. Enterprise diagnosis and reporting manual	38	1. What is <i>Kaizen</i>	36	1. 5S	71
2. 5S	120	2. A presentation on SWOT analysis	19	2. Technique of 5S· <i>Kaizen</i>	52	2. Condition and reality of SME	46
3. Muda Identification & Elimination	120	3. Presentation on 7 wastes identification	19	3. Activities of 5S· <i>Kaizen</i>	28	3. Visual control	15
4. <i>Kaizen</i> Promotion Team (KPT)	70	4. Presentation on <i>Kaizen</i> improvement & reporting	38	4. Activities of 5S in the factory	34	4. Diagnosis of SME	65
5. Soft Problem Solving Tools	50	5. 5S implementation	60	5. Wastes removing activities	34	5. Cost management	76
• Why-Why Analysis		6. Visualization	21	6. Visualization	43	6. Introduction to process simulation	62
• Brainstorming		7. Accounting	21	7. Digital <i>Kaizen</i>	28	7. 8 wastes of TPS	67
• 2H5W		8. Occupational safety, health and environmental mgt	30	8. 5S practice in the office	44	8. Layout	92
• Operation Analysis Chart		9. Industrial engineering 1]	42	9. Simulation of 5S week	40	9. Problem solving method and quality tools	69
• OPCDSEMG Analysis		10. Spaghetti diagram	9	10. Pasting pictures on Power Point	24	10. Work study	63
• 4M1E		11. Activation index	9	11. Consultant's morale and safety in the factory	40	11. Production management	216
		12. ECRS	11	12. Introduction to gender problem	23	12. Human resource	73
Intermediate Course		13. Inventory control	21	13. Inventory control	24	13. Management strategy	185
1. TPM	150	14. <i>Kaizen</i> method (IE-1)	21	14. IE	18	14. SMED	100
2. TPS	115	15. <i>Kaizen</i> method (IE-2)	39	15. 3S in the computer	10		1,200
3. TQM	150	16. <i>Kaizen</i> method (IE-3)	7	16. Shop layout	34		
4. 7QCC Tools & QC Story	130	17. Quality control	43	17. Preliminary study	18		
5. Basic of IE	230	18. Assessment of the impact in monitoring/FU sheet	17	18. 5S in SME	40		
• Time Study	40	19. Recommendation development	15	19. Marketing	30		
• Motion Study	35	Advanced Course		20. Introduction to bookkeeping and accounting	28		
• Line Balancing	20	1. Line Balancing Bottle Neck	7	21. 7QC Tools	22		
• Plant Layout	70	2. Activation Index	8	22. New 7QC Tools	32		
• Process & Operation Analysis	50	3. Streaming	4	23. Marketing strategy	28		
• Work Measurement	15	4. Design and Fabrication of Jig/Fixture	8	24. Measurement of result of 5S	12		
13. SOP	80	5. Shipping Control Board, Production Control Board, Delivery Control Board	7	25. SWOT	18		
		6. Spaghetti Diagram	9	26. Review of <i>Kaizen</i> approach	62		
14. Appropriate Costing	40	7. Man-Machine Chart	5	27. Exercise of diagnosis	20		
15. MRP	90	8. Set up Time Reduction	16	28. Management strategy	21		
16. Production Scheduling	80	9. Essence of 7QC Tools	9	29. Vision and Mission	12		
		10. QCC	6	30. 5S and QCC	20		
		11. QC Story	9	31. QC story	29		
		12. TQM	29	32. Exercise of QC story	7		
		13. Process Analysis	11	33. Skill map	15		
		14. Mode of Production and Cell Production	11	34. Simulation of diagnosis week	31		
		15. Supply Chain Management(SCM)	15		957		
		16. Inventory Management	30				
		17. ECRS	10				
		18. Motion Study/Economy	20				
		19. Working Capital Planning & Management	22				
		20. Total Preventive Maintenance (TPM) Preventive Maintenance	22				
		21. Karakuri Kaizen	20				
		22. Pull Production System	10				
		23. Toyota Production System & Pokayoke	42				
		24. Kaizen Master Plan	5				
		25. Enterprise Diagnosis <i>Kaizen</i> Report	47				
Basic :	433 slides	Basic:	480 slides	Total :	957 slides	Total :	1,200 slides
Intermediate :	1,065Slides	Advanced:	382 slides				
Total :	1,498 slides	Total:	862 slides				

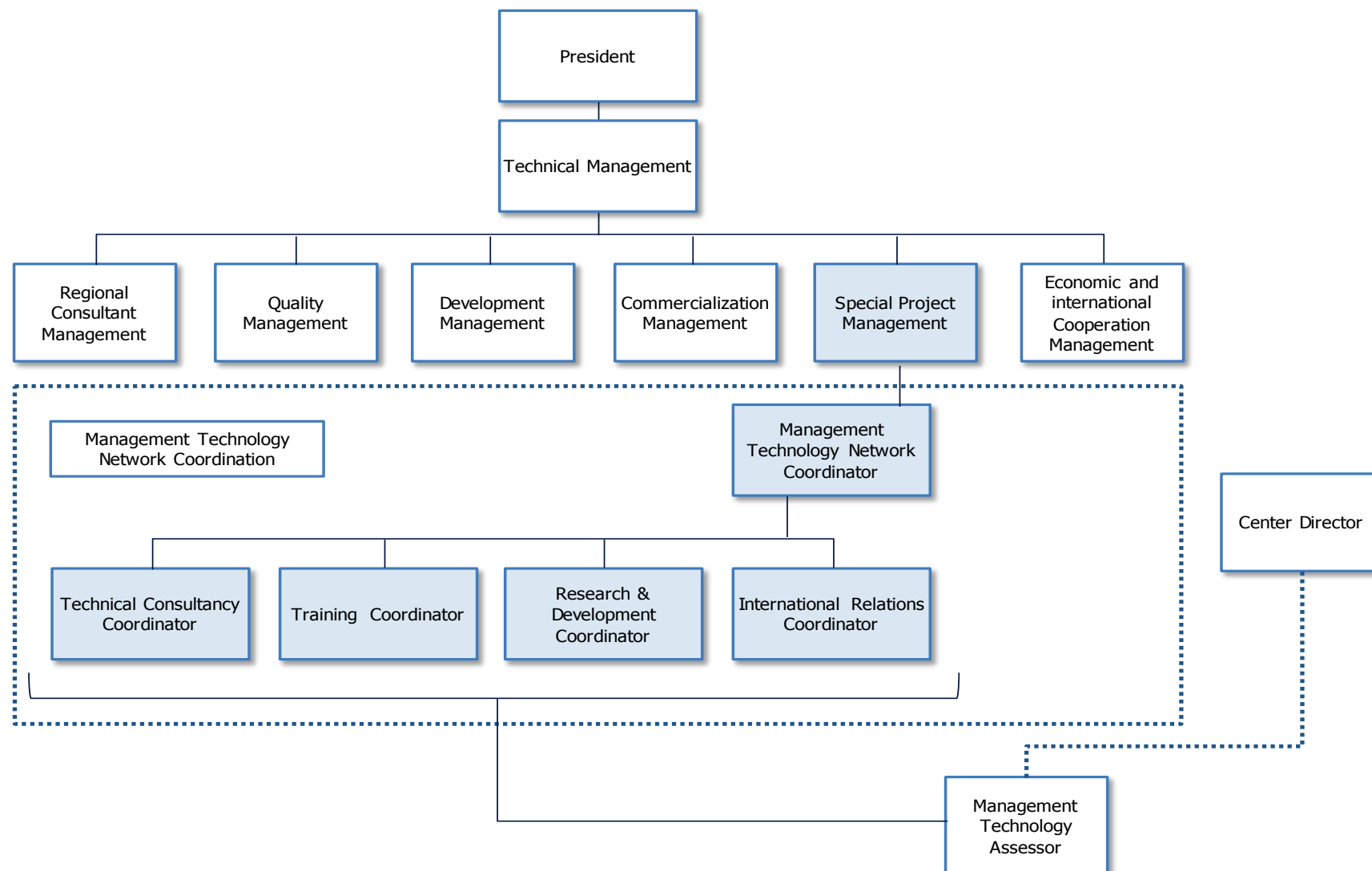
Note: The textbooks used in the above countries primarily incorporate textbooks and PowerPoint documents used in the JICA project as well as similar materials (excepting Malaysia and Singapore).

Source: Based on an extensive interview survey, the list was organized and compiled by the JICA study team.

Organization Chart of *Kaizen* Promotional organizations in each country

1. Argentine Republic

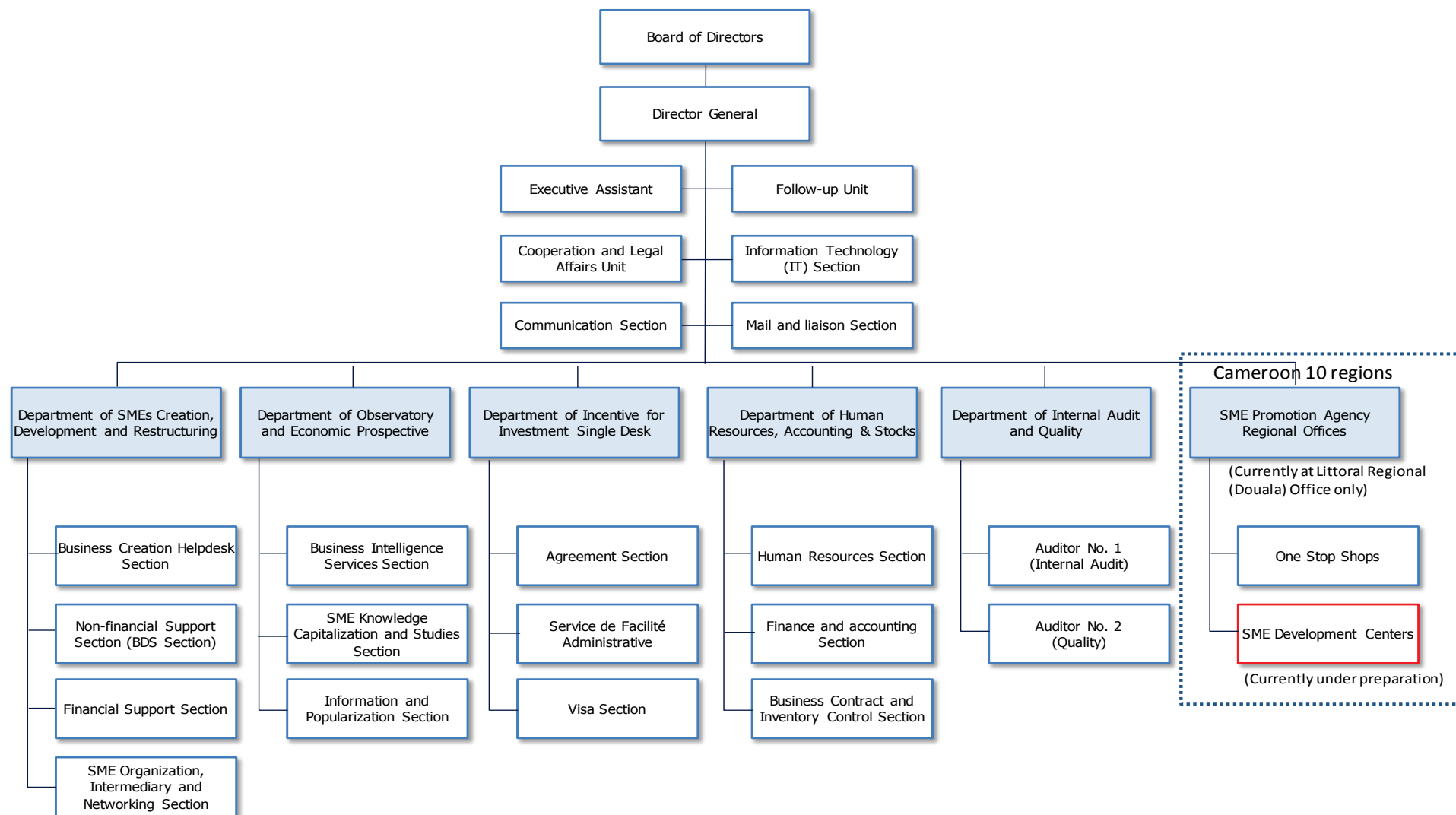
Instituto Nacional de Tecnología Industrial (INTI)



Source: *Kaizen* Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on *Kaizen* Promotion

2. Republic of Cameroon

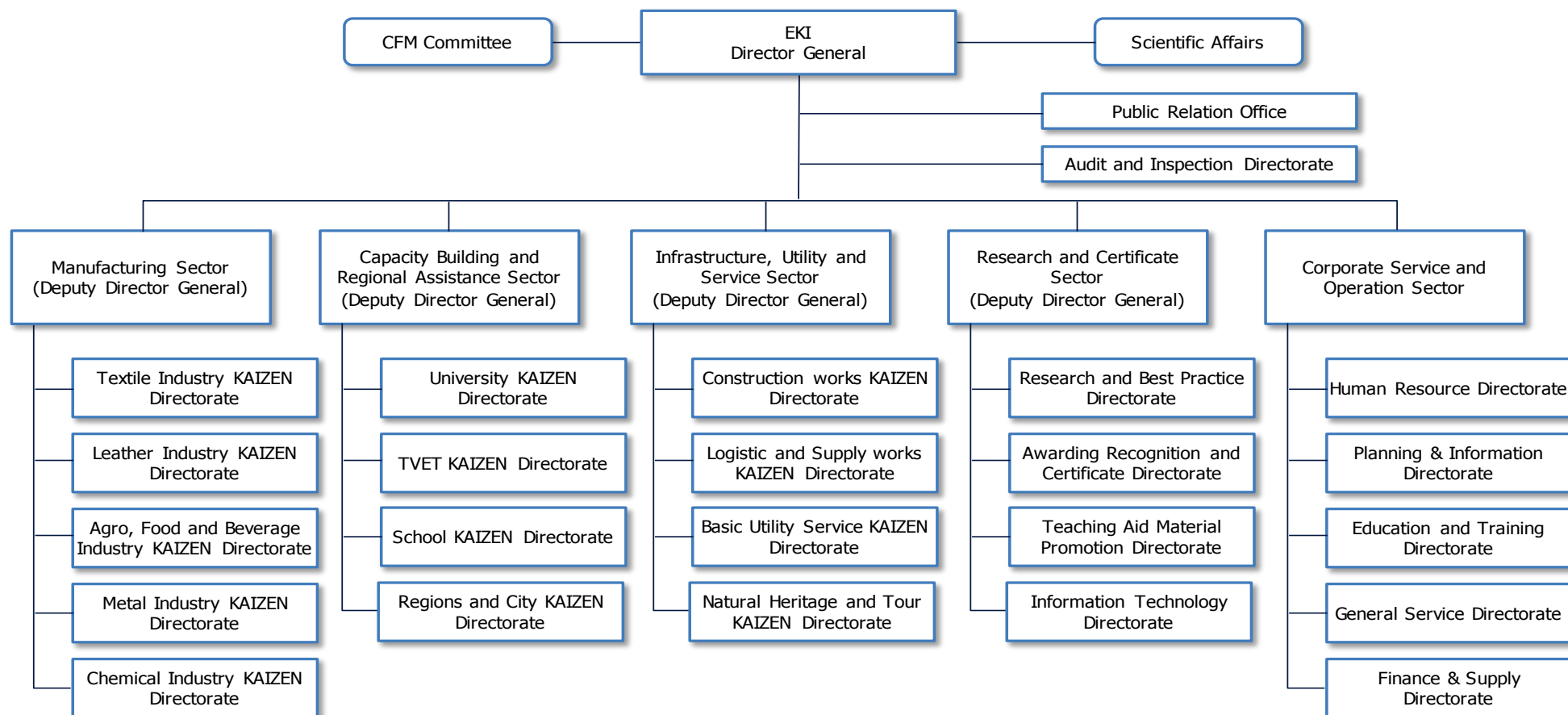
Agence de Promotion des Petites et Moyennes Entreprises (APME)



Source: Kaizen Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on Kaizen Promotion

3. Federal Democratic Republic of Ethiopia

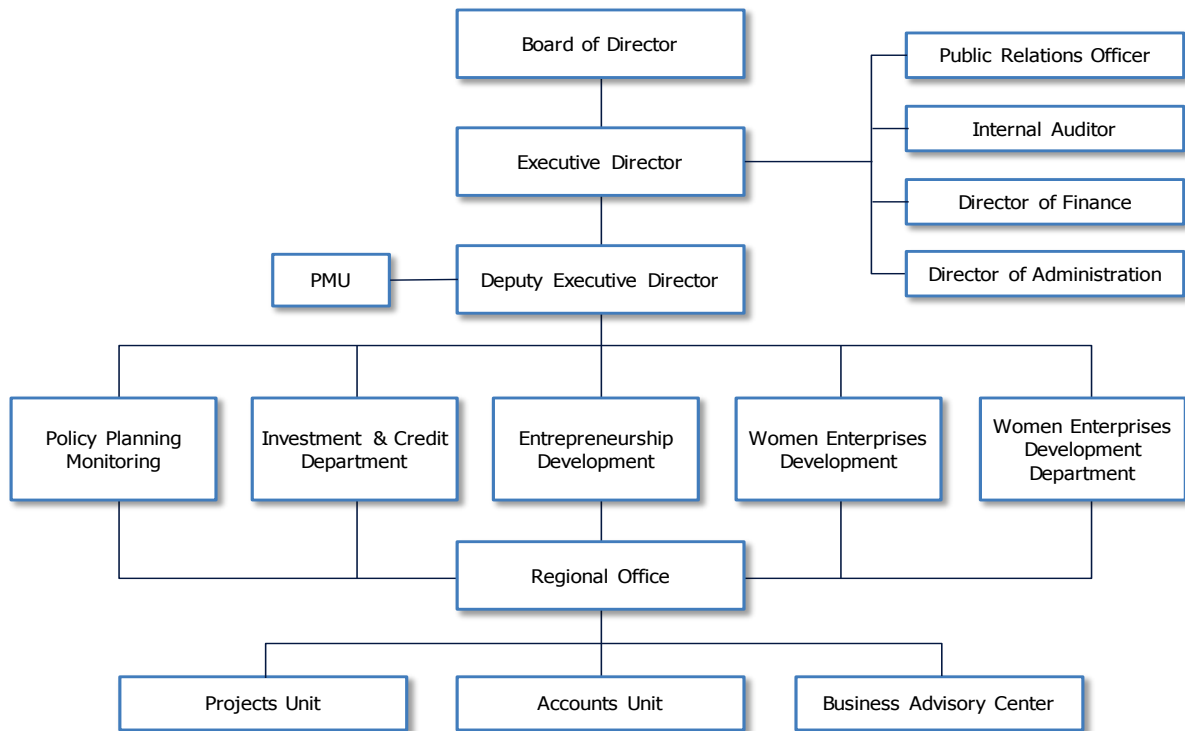
Ethiopia KAIZEN Institute (EKI)



Source: Kaizen Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on Kaizen Promotion

4. Republic of Ghana

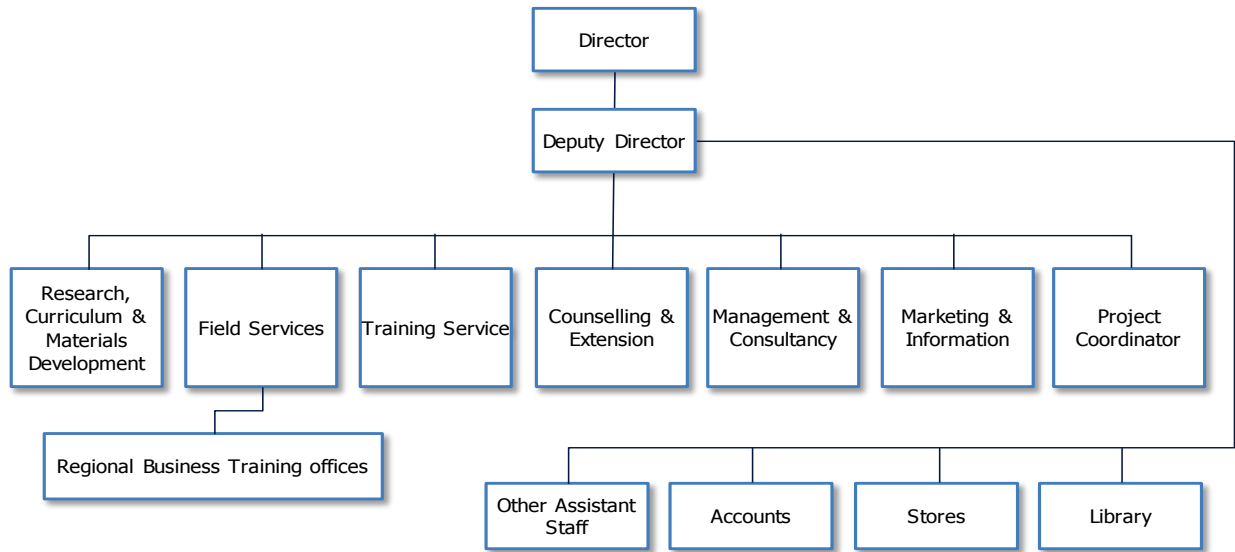
National Board for Small Scale Industries (NBSSI)



Source: *Kaizen* Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on *Kaizen* Promotion

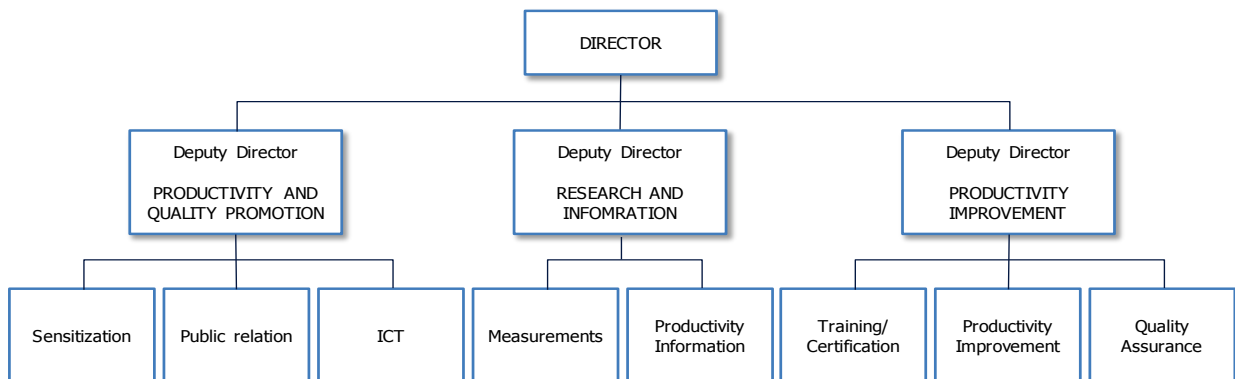
5. Republic of Kenya

Kenya Institute of Business Training (KIBT)



Source: *Kaizen* Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on *Kaizen* Promotion

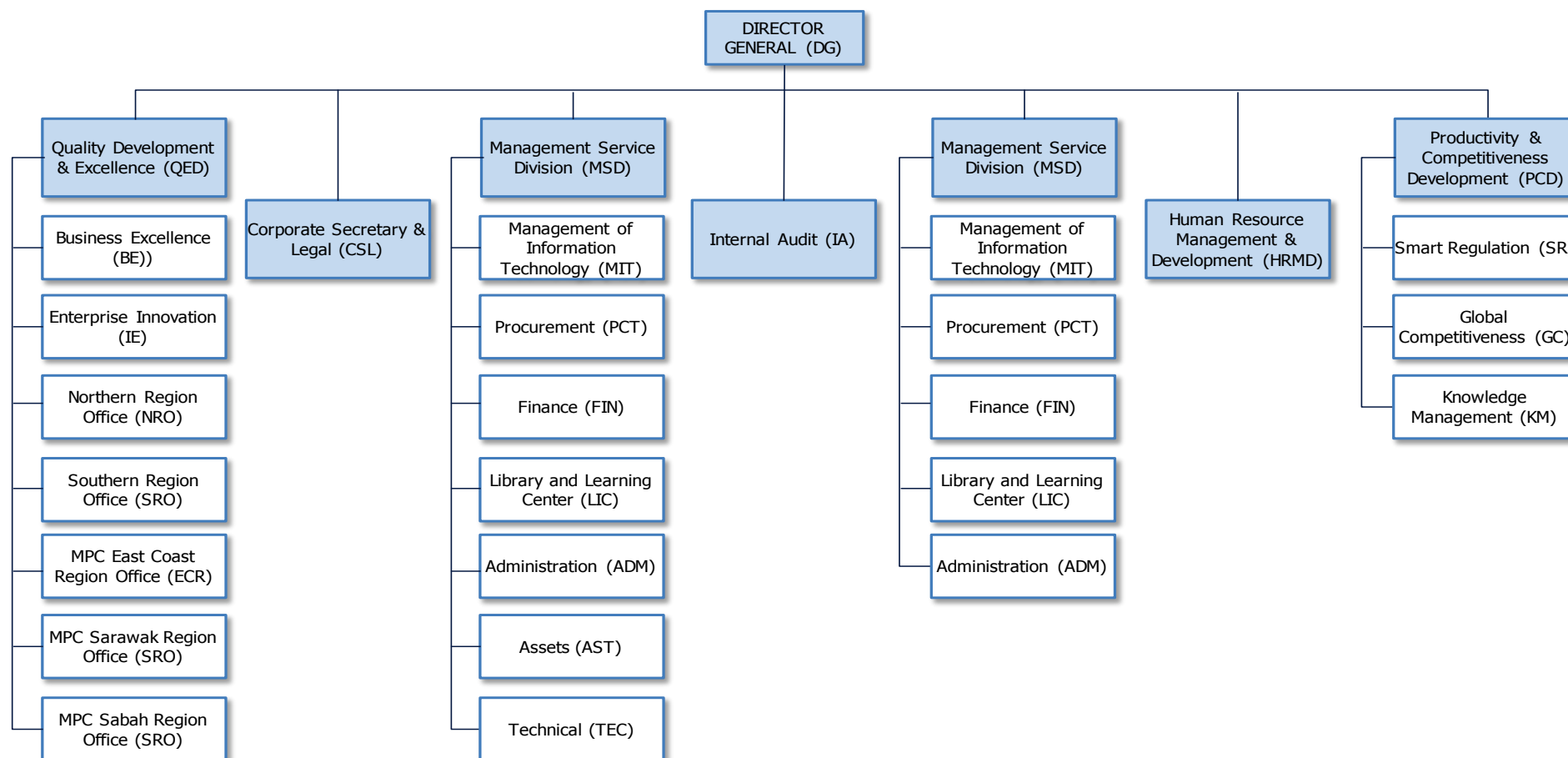
National Productivity and Competitiveness Centre (NPCC)



Source: *Kaizen* Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on *Kaizen* Promotion

6. Malaysia

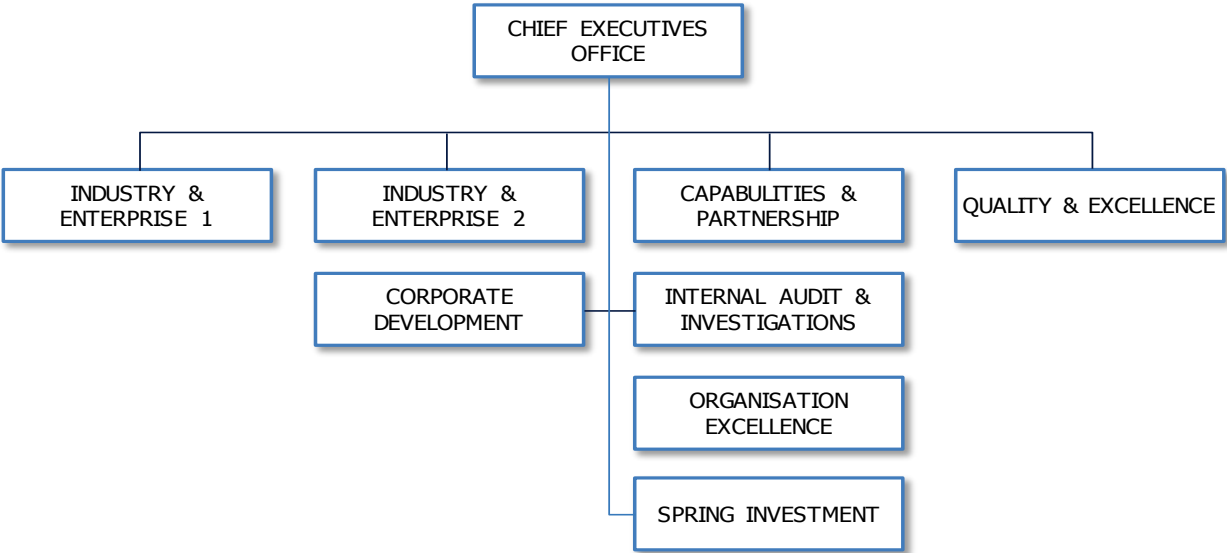
Malaysian Productivity Corporation (MPC)



Source: Kaizen Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on Kaizen Promotion

7. Republic of Singapore

Standards, Productivity and Innovation Board (SPRING)

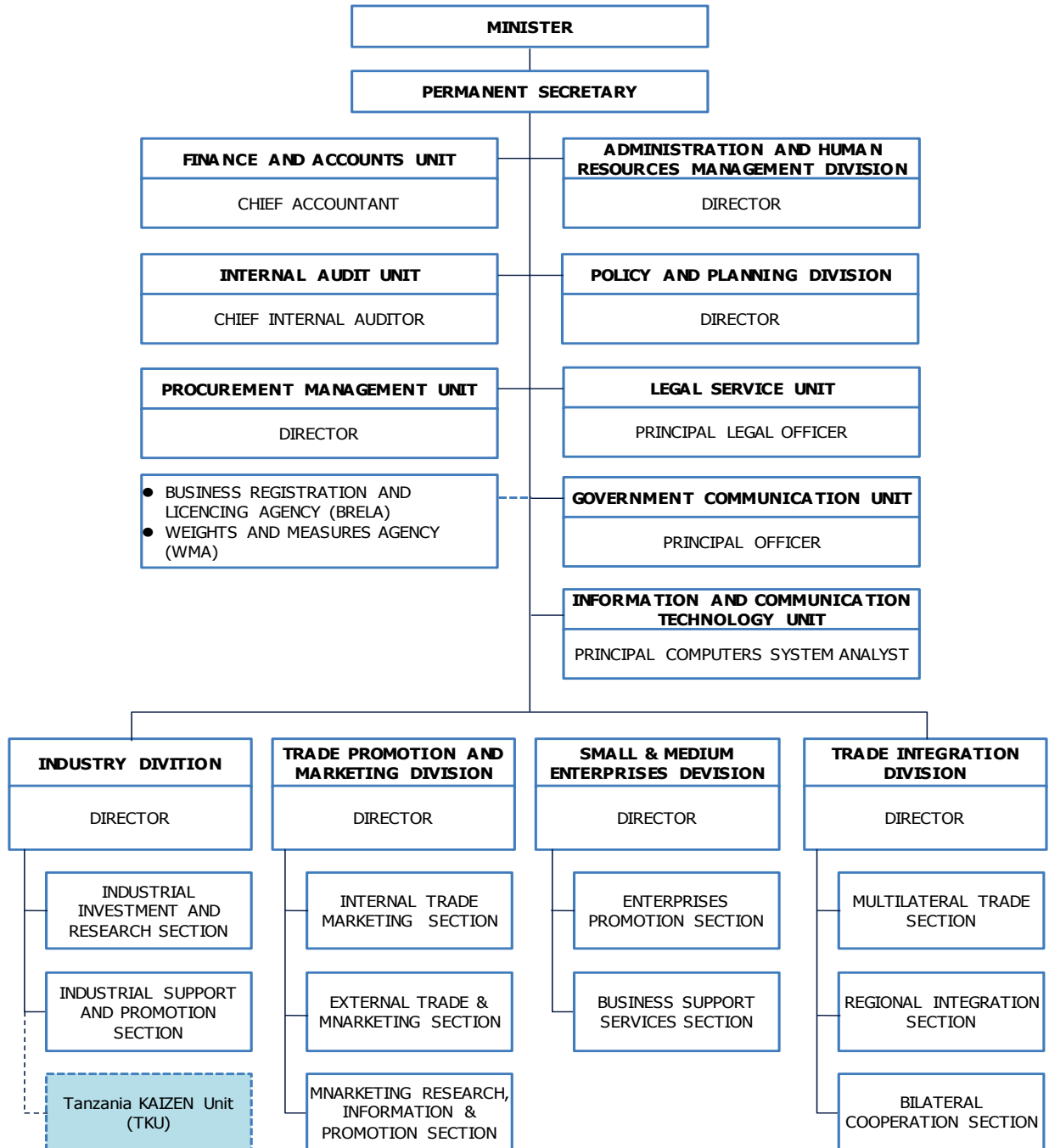


Source: *Kaizen* Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on *Kaizen* Promotion

8. United Republic of Tanzania

Ministry of Industry and Trade (MITI)

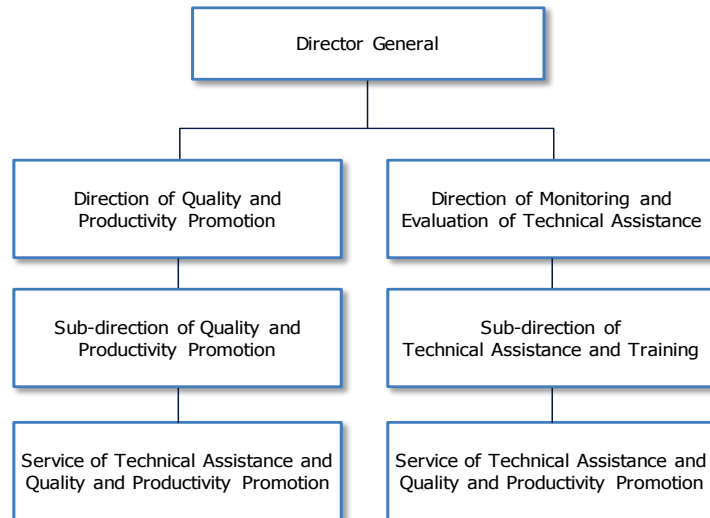
THE ORGANIZATION STRUCTURE OF THE MINISTRY OF INDUSTRY AND TRADE
(Approved by the President on 3rd June, 2011)



Source: *Kaizen Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on Kaizen Promotion*

9. Republic of Tunisia

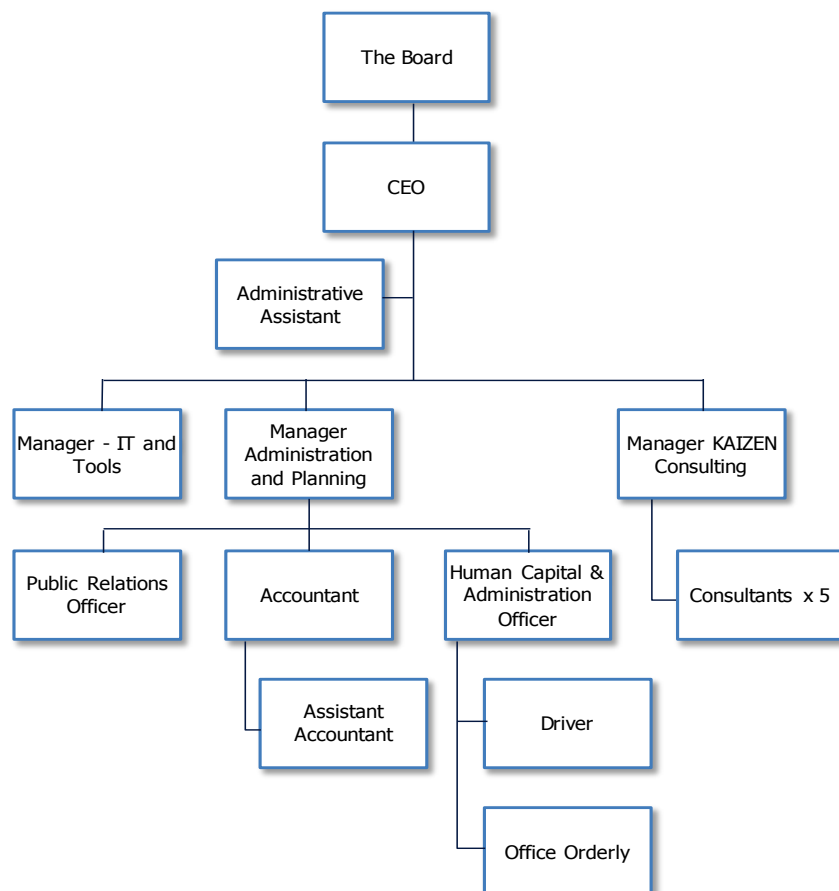
Unité de Gestion du Programme National de Promotion de la Qualité en Tunisie (UGPQ)



Source: *Kaizen* Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on *Kaizen* Promotion

10. Republic of Zambia

KAIZEN Institute of Zambia (KIZ)



Source: *Kaizen* Knowledge Sharing Seminar 2017 on 26th to 28th April 2017 in Nairobi, Kenya, Information Sheet on *Kaizen* Promotion

Appendix 2

Case Studies on *Kaizen* Dissemination

- Case 1: Role of Political leadership relating to *Kaizen* deployment and dissemination in Ethiopia
- Case 2: *Kaizen* effect measurement method in Ethiopia
- Case 3: Establishment of *Kaizen* Club in Zambia and the process of its autonomous management
- Case 4: Organization of the National *Kaizen* Conference in Zambia
- Case 5: The *Kaizen* Coordinator training system in Zambia
- Case 6: Training using a simulated production line in Tunisia
- Case 7: *Kaizen* PR activity in Cameroon
- Case 8: Development of education kits in Argentina
- Case 9: Mutual evaluation system for *Kaizen* Practitioners in Argentina
- Case 10: Private consultant registration scheme and the capacity recognition system in Malaysia

Case 1: Role of Political leadership relating to *Kaizen* deployment and dissemination in Ethiopia

The role of political leadership is essential when deploying and disseminating *Kaizen* at a national level. Without their support, it would be difficult to secure necessary budget, human resource and set-up institution.

【Case outline】

Kaizen deployment and dissemination in Ethiopia was initiated by former Prime Minister, Mr. Meles Zenawi. His request to the Japanese government for assistance on industrial policy dialogue and *Kaizen* approach marked the beginning of *Kaizen* deployment in Ethiopia, which quickly became a nationwide movement. In 2009, the technical cooperation project regarding *Kaizen* and the Industrial Policy Dialogue was officially launched in Ethiopia. The Policy Dialogue took place at (in) three levels; with the Prime Minister, relevant ministers, and ministerial personnel on working level.

In the dialogue, the progress of the *Kaizen* project is also reported, with candid discussion on important issues relating to actual implementation. During one of the sessions, Mr. Meles expressed the following opinion, "*Kaizen* is not a mere toolbox and must be a philosophy made up of the spirit of continuous improvement and the bottom-up community work. While some organizations want to learn *Kaizen* for its surface value of a productivity improvement tool, I would like to request the Japanese people to teach us in a manner so as to help us attain the inherent value."¹ This indicates profound understanding of Mr. Meles on *Kaizen*.

The JICA *Kaizen* project in Ethiopia was designed under elaborate and in-depth discussion between members of Ethiopia KAIZEN Institute (EKI) and Japanese experts. From the beginning, the Ethiopian side has shown a strong determination in developing its human resource. EKI demanded their staff members to show high commitment to the project. EKI also established a Master program on *Kaizen* jointly with Mekele University to further develop their staff's capacity and show them their career path. In addition, while implementing PDCA cycle of *Kaizen* application, the Ethiopians adjusted and localized *Kaizen* to the situation of Ethiopia. Meanwhile, EKI staffs who have been trained by Japanese experts and have gained certain level of on-site experience are becoming trainers of EKI staff outside the JICA project, indicating that a self-propelled human resource development system has been already built up.

The Ethiopian government also periodically checks the progress of *Kaizen* dissemination by collecting reports on *Kaizen* results. The annual *Kaizen* Award handed by the Prime Minister is also a form of monitoring and motivation. This monitoring system is one of the factors contributing to successful dissemination of *Kaizen* in Ethiopia.

【Key success factors】

A key success factor is the fact that top government officials show profound understanding on *Kaizen*, while the government clearly defines the positioning of *Kaizen* in Ethiopia's industrial development policy, and organizations responsible for *Kaizen* dissemination perform their work on the basis of good understanding on such government policy. At the same time, the Japanese side has made significant contribution by responding to the Ethiopian government's requests in a timely and consistent manner.

¹ from page 332 of "Designing Industrial Policies" by Prof. Kenichi ONO, 2013, Yuhikaku Publishing Co., Ltd.

Case 2: *Kaizen* effect measurement method in Ethiopia

So far only few countries developed own *Kaizen* effect measurement method. This is a successful case in Africa.

【Case outline】

In Ethiopia, the five-year development plan (Growth and Transportation Plan II; GTP2) sets forth quantitative targets regarding productivity and quality improvement for companies and organizations introducing *Kaizen*. EKI collects and summarizes the data (see the table below).

Quantitative target established in GTP2 (2015/16 – 2019/20)

KAIZEN implementation organizations	Manufacturing industry	Export companies	160
		Import substitution companies	95
	Service industry	Construction companies	30
		Tourism (organizations)	30
		Strategic service industry (organizations)	60
	Educational institutions	TVETs	120
		Universities	20
		Primary and high schools	120
		Kindergartens	120
Human resource development/small group activities	Manufacturing industry	Persons who have received training	98,000
		Number of small groups	10,500
	Service industry	Persons who have received training	17,140
		Number of small groups	2,450
	Educational institutions	Persons who have received training	20,000
		Number of small groups	2,000
Quantitative indices	Productivity	30% improvement	
	Quality	25% reduction of fraction defective by 25%	
	Cost	Reduction of waste (muda) by 50%	
	Delivery schedule	30% reduction of search time	

Source: EKI's presentation material on June 13, 2016

Notably, EKI computes not only the changes in quantitative indices before and after *Kaizen* implementation, but monetary effects (economic effects) of all *Kaizen* activities, including 5S. *Kaizen*'s results including economic effects are shared within the companies and employees, thus providing motivation for companies and organizations to implement and continue *Kaizen*. At the same time, these data are reported to the Ministry of Public Service and Human Resource Development (MPSHRD) by EKI serving as the basis for the government to proceed with *Kaizen* deployment and dissemination, and thus with budget allocation.

【Key success factor】

In many cases quantitative data regarding *Kaizen* effects within companies and organizations cannot be obtained because of untimely (when such information is wanted) collection. In Ethiopia, data of *Kaizen* results are collected regularly by using following measures and systems, thus enabling a virtuous circle of the target setting for *Kaizen* deployment and dissemination in national development plans, summation of results, and scaling-up activities.

- (1) Guidance to *Kaizen* Practitioners on how to measure *Kaizen* results
- (2) Guidance to client companies by *Kaizen* Practitioners on how to measure *Kaizen* results
- (3) Development of a standard form for reporting of *Kaizen* results by companies and other organizations
- (4) Collection and compilation of information on *Kaizen* results by responsible departments or organizations of companies in the manufacturing and service sectors and educational institutions

Case 3: Establishment of *Kaizen* Club in Zambia and the process of its autonomous management

This is good case to disseminate and to learn *Kaizen* with local people

【Case outline】

In 2014 when the JICA *Kaizen* project was launched in Zambia, *Kaizen* Club was established as a social group under the leadership of *Kaizen* leaders within pilot companies and organizations. The club was organized for the purpose of promoting information exchange on *Kaizen* activities among member companies as well as learning good practice from each other. The first management committee meeting was held in December 2014 to select a chairman (president of a medical and business equipment sales company, which is a pilot company) and to agree on the articles of association and the scope of activities. Since then, it is operated as an independent organization on the basis of an annual fee collected from member companies.

Activities involving the club members started in April 2015, consisting of mutual corporate visits and information exchange among companies in different industries, e.g., manufacturing, sales and transportation. Corporate visits have been held a few times annually to promote the sharing of good practice relating to *Kaizen* implementation at member companies, while serving as an opportunity for mutual enlightenment among the members by exchanging opinions and ideas based on new discovery. The club started up its blog in 2015, where information on *Kaizen* Club's activities is posted together with ideas and topics relating to *Kaizen* allowing the members to share relevant knowledge and information.

Since 2016, its activity has expanded outside the capital city to regions. A meeting held in Ktwie in May year? consisted of field tours on *Kaizen* activity, study groups, and discussion, which became effective in promoting *Kaizen* deployment and dissemination throughout the country. Also, the chairman of the *Kaizen* Club made speeches and introduced the activities of the club on KIZ's annual training programs conducted for *Kaizen* leaders within pilot companies with an aim to expand membership by inviting the participants to join the *Kaizen* Club.



Inauguration meeting (2014)



Study meeting (2015)



Awareness Seminar (2016)

【Key success factors】

As *Kaizen* Club is an organization spontaneously established by *Kaizen* leaders of pilot companies, primarily using the occasion of the collective education program. Its members have a strong sense of participation. In particular, the chairman's leadership and activeness is considered as a key success factor. Also, the club has been leading *Kaizen* dissemination in Zambia, in collaboration with KIZ's management and collaboration between *Kaizen* experts and the club's activities, which are expected to further energize *Kaizen* activities and help to increase membership.

Case 4: Organization of the National *Kaizen* Conference in Zambia

This is the oldest *Kaizen* Award event in Africa since 2010.

【Case outline】

In Zambia, the National KAIZEN Conference has been conducted annually since 2010 to compete on the results of *Kaizen* activity by QC circles and under the guidance of JICA's Senior Overseas volunteers. The conference is modeled after the QC Circle convention held by JUSE in Japan and the International Convention on QC Circles held on a world scale and is designed to select winners through competition by QC circles in the country.

The target was originally manufacturing companies only but non-manufacturing companies and public organizations were added from the fifth and sixth conferences in 2015 and 2016, respectively. Companies (QC circles) making presentation are companies which received technical guidance from Japanese experts in the previous year and recommended by them. The conference, including the opening speech by the conference host, is reported by newspapers every year contributing to increased recognition on *Kaizen*. Since the fourth conference foreign case studies are introduced by foreign experts.

Participants are able to re-learn their activities and discover their challenges through preparing their presentation, while they are also able to learn much from other presenters. The conference is providing a mutual enlightenment opportunity on *Kaizen*. The conference also serves as an effective PR tool for *Kaizen* deployment and dissemination on a nationwide basis and in all sectors. An increasing number of companies are inspired by nationwide media reports and express interest in *Kaizen* guidance. Thus, the National *Kaizen* Conference has become an important and notable event in the country and presents a typical example for other countries in connection with *Kaizen* dissemination and deployment, and interchange between *Kaizen* implementers including the exchange of opinions.



Kaizen Conference (forum) in 2014



Overview of *Kaizen* Conference in 2015



Kaizen Conference in 2016, together with the Minister and Vice Minister of Ministry of Trade and Industry

【Key success factors】

In planning and organizing the *Kaizen* Conference, a preparatory committee is established 4-5 months earlier to carry out a whole range of activities: recruiting, selecting companies, making presentation, providing technical guidance and advice for presentation, program planning, designing of methods for management, and evaluation and awarding based on manuals prepared for the purpose. This purposeful preparation process assisted to create and maintain mutual enlightenment and high promotional effects. Also, for active promotion to industrial organizations, the mass media and other influential parties were proven to be critical. While initially the cost of the conference's organization and management were largely covered by JICA, recently budget allocation by the Zambian government has increased with a plan to solicit contributions from private companies.

Case 5: The *Kaizen* Practitioner training system in Zambia

This is a training method closer to the standard approach proposed in this handbook.

【Case outline】

In recognition of an essential role of practitioners in sustainable implementation of *Kaizen*, Zambia has been training practitioner through a variety of activities. In particular, in-company *Kaizen* practitioners are trained in a planned manner by means of three activities (collective education, participation in the OJT program, and presentation at the *Kaizen* Conference). Furthermore, the involvement of top management in practitioners training is a unique aspect of the practitioner training system in Zambia; a company that participates in the practitioner training program is selected on the basis of criteria as to whether the top management understands the value of the practitioner training plan, together with availability of qualified personnel (leadership experience, commitment to *Kaizen*, and/or experience in *Kaizen* implementation). The following table shows a course outline for collective education of candidate practitioners.

Collective Education Program for practitioners in 2016

Day/time	Subject	Duration
1st day	08:30-09:00 Opening Speech (KIZ CEO)	0.5 hrs.
	09:00-12:00 <i>Kaizen</i>	3.0 hrs.
	13:00-16:00 Duty of <i>Kaizen</i> Coordinators	3.0 hrs.
2nd day	09:00-12:00 Muda-dori	3.0 hrs.
	13:00-16:00 QCC/Team Work	3.0 hrs.
3rd day	09:00-11:00 5S & Visual	2.0 hrs.
	11:00-16:00 7 QC Tools	4.0 hrs.
4th day	09:00-12:00 Inventory Control	3.0 hrs.
	13:00-15:00 Layout	2.0 hrs.
	15:00-15:20 Policy Deployment	0.3hrs.
	15:20-15:40 Remarks from UK expert	0.3hrs.
	15:40-16:40 Quality Culture (<i>Kaizen</i> Club Chairperson)	1.0 hr.
	16:40-17:00 Closing Remarks (KIZ CEO)	0.3hrs.
Total (4 days)		25.4hrs.

During *Kaizen* activities within a company, on-site guidance and advice has been conducted under the leadership of *Kaizen* who then leads *Kaizen* activity on the basis of in-company diagnosis. Content of each field guidance activity was compiled into a formal report by KIZ's *Kaizen* disseminator which was sent to pilot companies and practitioners to ease future guidance by the QCC team. It has also been used as the basis of reporting to top management of pilot companies and other organizations. Finally, efforts were made to raise the awareness of practitioners, as in-company *Kaizen* leader, by making them to present a formal report on *Kaizen* activities and outcomes at the conference. During the three-year project period, a total of 54 *Kaizen* practitioners were trained.

【Key success factors】

The training of *Kaizen* practitioners is essential to maintain continuous *Kaizen* activity within the company. In doing so, personnel having required *Kaizen* skills are expected to play a vital role expected from *Kaizen* activity leaders. Meanwhile, an organization to conduct sustainable *Kaizen* activity with practitioners being the core of such activity would be formed. Furthermore, certification of KIZ practitioners will become a publicly recognizable status and provide further motivation for *Kaizen* activity. Finally, participation in the training program with practitioners of other companies will help to strengthen the exchange of experiences among companies and provides learning opportunity for those companies who don't have prior knowledge or experience.

Case 6: Training using a simulated production line in Tunisia

This is effective case in terms of *Kaizen* practitioner training (using a simulated production line), in a different way from Zambia in Case 5.

【Case outline】

During the training program conducted in Japan as part of the Quality/Productivity Improvement Project (Phase I) of Tunisia, a *Kaizen* training program was given using a simulated production line in cooperation with Panasonic Company at the company's Monozukuri (manufacturing) Training Center. The training program inspired Tunisian consultants and subsequently requested for JICA assistance to install a similar one in Tunisia.

In response, JICA supplied equipment and materials for a simulated production line to Tunisia and sent 2 experts to introduce the *Kaizen* training with the help of simulated production line to Tunisians to train personnel capable of providing technical guidance using the equipment.

As of 2017, the Quality/Productivity Improvement Project (Phase II) is conducted (between 2017 – 19), using the simulated production line not only for the ToT program but also for open training programs held by various technology centers under CETIME, one of the project's counterpart organization. Meanwhile, CETIME receives requests and proposals from companies for training programs to use the equipment to simulate for their products.

To this date, JICA has been implementing a number of *Kaizen* projects in Asia, Latin America, and Africa, but Tunisia is the only country where the simulated production line is installed. It helps to apply *Kaizen* proposals on the basis of process/work analysis results and develop optimum *Kaizen* methods through repeated trial and error steps as carried out in an actual production line. The *Kaizen* training program using this equipment provides highly effective learning opportunity to streamline class room training (CRT) and in-company training (ICT), by simulating *Kaizen* theory learned during CRT on how to apply in an actual work environment prior to ICT.



【Key success factors】

The success of the simulated production line is attributable to effective implementation of technology transfer to support continuous operation by the Tunisian C/P that consisted not only the provision of the equipment but also sending Japanese experts to conduct training on the use of the equipment. Furthermore, the strong commitment of CETIME to learn the operation of the equipment before starting actual operation by the project has contributed greatly to keep sustainable maintenance and operation for five years after the provision of the equipment.

Case 7: Kaizen PR activity in Cameroon

This is a case of good PR method and activity.

【Case outline】

The *Kaizen* project in Cameroon is primarily designed for micro and small enterprise of which the informal sector dominates the major part. The primary purpose was, therefore, set to carry out PR activities that can be understandable and acceptable to everyone. The PR activities were consisting production of a music video outlining *Kaizen* and its activity which was broadcasted for two months on a popular TV music program, and uploading on social media.

The music video was produced by a professional sing-a-song writer in Cameroon in French and English versions focusing on 5S and *Kaizen* as main theme. The video presents images that explain 5S in tune with music and actual *Kaizen* activities conducted by local companies. Also, the ceremony for the completion of a *Kaizen* consultant training program was presented, which was held in the presence of Cameroon government officials, including the Minister of MSME&SEH, the Japanese ambassador, TV stations and newspaper companies. Furthermore, the video included a scene at a garment company's ceremony, where government officials, JICA personnel, and personnel of GIZ (Germany's aid organization) joined the dancing crowd, adding a pleasant impression to the total video presentation. Note that, the video was produced under close collaboration of Japanese companies, including Toyota and Makita, e.g., the use of their warehouse and other facilities to film actual 5S and *Kaizen* activities.

After the completion of the video, different versions that insert French/Japanese and French/English subtitles were posted on YouTube, which received broad responses from not only Cameroon but also overseas (https://youtu.be/JWdPnmP_P6Q (French / Japanese), <https://youtu.be/Jd16J9CyY6U> (French / English), <https://youtu.be/LIOVaep2Ayk> (English)). Then, the video became known to the Japanese foreign ministry and was shown at the Global Festa Japan (also in Kenya at JICA's Africa *Kaizen* Knowledge Sharing Seminar). Furthermore, it was uploaded on Facebook, Twitter and WhatsApp and also broadcasted by NHK. In July 2017, it received JICA's PR tool section award.

		
<p>Shooting at CAMI-TOYOTA, Toyota's agent in Cameroon</p>	<p>A scene shoot at a female entrepreneur's factory, who attended at JICA's training program in Japan</p>	<p>The music video scene shown in Cameroon's TV music program, where a singer danced before the minister and the Japanese ambassador</p>

【Key success factors】

The production of the music video was originated from needs survey conducted for local companies at the beginning of the JICA project. An artist of an art-related company covered by the needs survey composed an original song in tune of ethnic music in Littoral, Cameroon, which was combined with images introducing *Kaizen* to make a formal educational video. As the professional artist studied *Kaizen* prior to video production, the video has successfully merged the Cameroon culture and *Kaizen's* basic philosophy and structure in a comprehensive manner. Its effective use on TV and social media has led to the successful PR activity.

Case 8: Development of education kits in Argentina

Development of various tool kits for *Kaizen* training.

【Case outline】

Instituto Nacional de Tecnología Industrial (INTI)² in Argentina, jointly with JICA has developed and produced an education kit to learn *Kaizen* (quality/productivity management) in the form of game. The kit, called "Actividades Didácticas Instructivo: Didactic Activities Instructive," is designed to allow players to experience and understand major *Kaizen* tools through experience. Up to July 2017, INTI has developed 12 game kits with a plan to cover all the *Kaizen* modules. These kits are equipped with standard manuals and demonstration videos to help INTI *Kaizen* Consultants use them properly in combination with classroom trainings. The game kits are favorably received by companies, educational institutions and *Kaizen* promotion organizations when introduced in various events. INTI is currently considering producing the game kits on a commercial basis.

【Examples of the INTI game kits】

1. 5S: A puzzle game to combine 4-color parts to form a designated shape, designed to teach players that seiri/seiton at workplaces leads to reduction of working hours.
2. Quality management: A game to visually select adequate parts from a pile including defective items, designed to learn the importance of a quality management standard and the manner to establish it according to the customer's request.
3. Time study: A game to compete for short worktime required to insert parts of different lengths and colors into right places, designed to learn the method to analyze the series of work procedures in terms of efficiency and the importance of standardization.
4. Kanban: A game to build houses of six different colors by using dices that serve as an external factor and trading parts with other players, designed to learn how to efficiently trade parts between pre- and post-processes and to provide only necessary parts without keeping excess inventory.



Kaizen (quality/productivity improvement) game kit



Kaizen (business management/cash flow) game kit

【Key success factors】

By using a *Kaizen* game to have a simulated experience after the classroom learning of each *Kaizen* tool, theory and practice can be effectively linked to achieve better understanding. A difficult theory can be learned in the form of game playing. Every student is able to learn all the subjects regardless of background knowledge, experience, academic background or language skill.

² Instituto Nacional de Tecnología Industrial (National Institute of Industrial Technologies)

Case 9: Mutual evaluation system for *Kaizen* Practitioners in Argentina

This is a good knowledge and experience sharing method in organization. In addition, regional staff can also share it and use for their work.

【Case outline】

INTI in Argentina, in charge of *Kaizen* deployment and dissemination, reports and shares the results of corporate guidance activities via the in-house intranet. While the number of companies that *Kaizen* Practitioners can coach directly and the number of *Kaizen* -related methods that can be taught are limited, the intranet system allows its viewers to efficiently learn *Kaizen* case studies relating to companies of various industries and sizes, including hints for their own *Kaizen* guidance activity. Also, the viewer can send comment to the reporter, thus functioning as a mutual learning tool among *Kaizen* Practitioners.

The content reported in the intranet system is organized in a standard form that consists of the following 7 items.

- | | |
|-----------------------|-----------------------------------|
| (1) Introduction | (5) Implementation of Action Plan |
| (2) Initial Situation | (6) Result |
| (3) Objectives | (7) Conclusion |
| (4) Methodology | |

Case studies on companies that have received awards for excellent *Kaizen* results can be learned in detail as to what activities were undertaken and what results were achieved (*Kaizen* case studies on such companies summarize the changes in relevant indices before and after implementation of *Kaizen* together with *Kaizen* -related costs and economic effects). The reported cases are compiled into booklets.



INTI *Kaizen* Case Studies 2013 – 2016 (booklet)

【Key success factors】

The standardized 7 items cannot be fully filled out unless the study prior to *Kaizen*, *Kaizen* planning, implementation, and post-project evaluation are made completely. In other words, the *Kaizen* Practitioner can report and share each *Kaizen* case study properly, because INTI provides sound training for *Kaizen* Practitioners. Reporting skills help to promote effective mutual learning. *Kaizen* Practitioner reports his or her case study within a standard framework using photos and tables effectively..

Case 10	The private consultant registration scheme and the capacity recognition system in Malaysia
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This is one of the capacity recognition systems.

【Case outline】

Malaysia Productivity Center (MPC) is effectively utilizing private consultants to carry out large number of company support projects. MPC officers are concentrated on project management since its internal resource is limited. For efficient and effective use of outside consultants in the private sector, MPC has a private consultant registration scheme that includes the following registration requirements; (1) registration shall be made by a legal entity (not personal registration); (2) the legal entity shall be registered under the corporation law and (3) a consultant to be registered shall have experience of 20 years or longer. As of September 2017, around 250 companies are registered.

Note that out of 250, 40 companies are consulting firms established by MPC's former employees. These companies serve as a network of MPC's knowledge and experience.

Private consultants hired by MPC are required to provide training for companies by using standard teaching materials produced by MPC (each consultant is allowed to add actual cases and other information) which serve as the basis of ensuring quality of MPC's service content.

(Recognition system)

In Malaysia, there is a recognition system called Productivity Champion designed to expand the base of *Kaizen* practitioners. This is not a qualification or license and should be considered as recognition on a specific ability relating to productivity improvement.

The Productivity Champion system is effectively linked with the private consultant registration scheme as many private consultants hold this recognition (some of MPC staff members as well).

The system has been fully established since 2016. There were two types of Productivity Champion; (i) Productivity Leader (mainly company managers who are leaders of quality/productivity improvement activities), and (ii) Productivity Practitioner who is considered to have comprehensive knowledge and skills relating to quality/productivity activities, including private consultants (such as a retired person from MPC). The Productivity Champion is mainly required to have satisfactory field experience and company evaluation, while no written test is required.

In addition to the above two recognitions, four were added in 2017 (including Consultant and Assessor). Today, there are six types of Productivity Champion. MPC plans to recognize 400 Productivity Champions (for all the six types) by the end of 2016. MPC is planning to establish the Productivity Champion Committee and the Evaluation Committee within MPC. The former will manage the recognition system while the latter conducts periodical evaluation for qualified practitioners (Productivity Champion candidate).

【Key success factors】

Within MPC, some argued to call it a certification system, not a recognition system and the latter seems to have been selected because of manageability. This is a more realistic system for MPC, since there are limited resources in terms of finance and staffs and encouraging private consultants to take an active part MPC's programs.

